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SERIOUS MENTAL DISTURBANCES CAUSED BY PAINLESS DENTAL LESIONS.

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In the skiagraphic study of the teeth and jaws there are involved, in addition to the common superficial lesions, many which lie deeper. These lesions cannot be detected without the aid of the X-rays. The most important are impactions which have prevented eruption, abscesses at or near the roots, exostosis, now called by the dentists pericementosis, and pulp nodules. To these may be added extensive caries, especially when under fillings, and large fillings in contact with or near the pulp. These conditions are often though not always painless. A study of their relations with various nervous and mental conditions extending over almost four years has shown me that they are often disastrous to nervous and mental health. Cases unaccompanied by pain acquire an especial importance from the fact that their origin is usually unrecognized.

The following cases are selected to show a fairly wide range of dental lesions. The importance of their full and early recognition and complete removal is shown by a study of the attendant symptoms, the cases including, as they do, some of the most severe and intractable forms of the psychoses.

The first case is not one of insanity, but an instance of a whimsical mental aberration which, recognized as such by the patient, seems even less real and less reasonable than do the better known forms of delirium and delusion. The patient was nineteen years old, prepossessing in appearance, of good color and physique. She had been well until the beginning of this illness. The only deviation from the normal which had ever been noticed about her was that when twelve years old she was for a time unwilling to make a positive statement. She would say, "I think so" and "I believe so." This lasted for some months and then passed off. Two or three years ago she began to have a fear that she was contaminated. This gradually increased until she spent the greater part of the day washing herself and objects with which she came in contact, such as door-knobs and household utensils. She then spent a winter in California. While there she heard a great deal about tuberculosis, and transferred her delusion to a dread of consumption. She did not fear for herself, but was afraid that she was spreading the germs. She came back in perfect physical health, robust looking, sleeping and eating well. Her mental state, however, caused herself and her family great misery. She had no pain anywhere, except occasional mild frontal headaches. She never in her life had toothache or dizziness.

Inspection of the mouth showed an unusually fine dentition. The third molars, however, were absent. Skiagraphs taken at the time of the first examination in June, 1909, showed them unerupted and still in the jaws, the lower ones impacted and angled against the second molars. (Figs. 1 and 2.) The upper third molars were not angled but were badly crowded. All of the third molar teeth were extracted at that time.

For a month following the operation the patient was in the same condition. Then improvement began and was progressive. She entered college in the autumn, made a good record

there, and at the last report, fourteen months after the operation, was well and in good spirits.

This is a classical instance of a sufficiently common type of mental disorder, obsession, in the disease called by Janet psychasthenia. An absolutely pure local irritation without toxic action was the cause of as near an approach to the simple delusion as is ever found in mental alienation; but while the patient gave expression to a false idea, which she recognized as a delusion, a short experience with her sufficed to show that she was constantly worried, and this emotion was so overpowering as without doubt to warp the quality of her thought.

So simple a lesion, with so definite a result, is not common. More often both lesions and resultant symptoms are complicated, as in the following instance.

Case two was a woman twenty-seven years old, for many years nervous, who had had a definite mental breakdown on several occasions, each time having the same delusion. She had a morbid fear of a child whom she knew at school, but had not seen for a long time. She worried constantly about this matter, whose triviality she fully realized. She also had various doubts and uncertainties, went back to see if she had closed the door, and other things of like kind. She was sleepless and looked haggard and worn. There was no headache, but a heavy feeling at the nape of the neck. She had had no toothache or earache for many years. General physical examination gave an entirely negative result. On skiagraphic examination a lower second molar tooth was found impacted against the second bicuspid, the first molar having been removed in childhood. (Fig. 3.) This tooth was extracted in October, 1909. Two bicuspid teeth in the upper jaw showed marked abscesses at the root and were extracted a week later. (Fig. 4.) A month afterward the patient insisted that she was no better in any way. An examination, however, showed that her color was better, her face looked plumper, and while she expressed herself as discouraged, her talk was distinctly less dismal than it had been. From this time her improvement was progressive, and ten weeks after the operation she was

entirely well. Her appetite was good and she was cheerful and in a normal mental state. She has remained so ever since.

The sequence of events after the operation was in this case typical of what happens when irritation causes both mental and physical symptoms. Physical improvement is noticeable early, and somewhat later mental gain begins, the two then going on together. Emotional symptoms clear up first. Delusions persist until after the emotional substratum has disappeared.

The third case presents an example of a psychosis at once more severe and more complex. The patient was a man 55 years of age, large, fleshy and rather pale, and was first seen in December, 1908. He had met with a severe personal bereavement twelve years before, and began to be nervous and sensitive. He was mentally affected from that time on, with periods of insomnia and melancholy, during which he cried readily, was easily fatigued and irritable, and waked in the early morning with apprehensions of indefinite ills. He suffered much from flatulence and sour stomach, and his most constant apprehension was that he had a growth or an animal in the stomach. Several consultants assured him after thorough examination that there was no serious organic disease, and ordered the usual palliative measures. Physical examination gave negative results. There remained in his jaws only seven upper teeth, and one lower one, all of them in an advanced stage of pyorrhea. The gums were eaten into by deep suppurating ulcers. On skiagraphic examination extensive alveolar abscesses were found. (Figs. 5 and 6.) These conditions are so bad that it seems as if they must be exceptional. Caps on abscessed teeth, and bridges over rivers and stagnant pools of pus make a not very creditable showing for the dentist who did the work. Unfortunately such conditions are common, on account of the neglect of the teeth by the majority of the population, and the neglect of skiagraphic diagnosis by dentists and physicians.

There had been no headache or other pain except a moderate aching in one of the teeth. No connection had been noted between these occasional toothaches and the other symptoms. Extraction of all the teeth was recommended and promptly

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carried out. The patient began to feel better within a few days, and since then has slept well, has recovered from his delusions, and has been able to attend to his usual business without interruption. Occasional attacks of indigestion remain. It is unfortunately impossible to remove the organic results of irritation and septic poisoning on the abdominal and other viscera after a duration of so many years. In this sense complete recovery is not to be attained in such cases. The improvement is such as might be expected from the removal of the main causative factor.

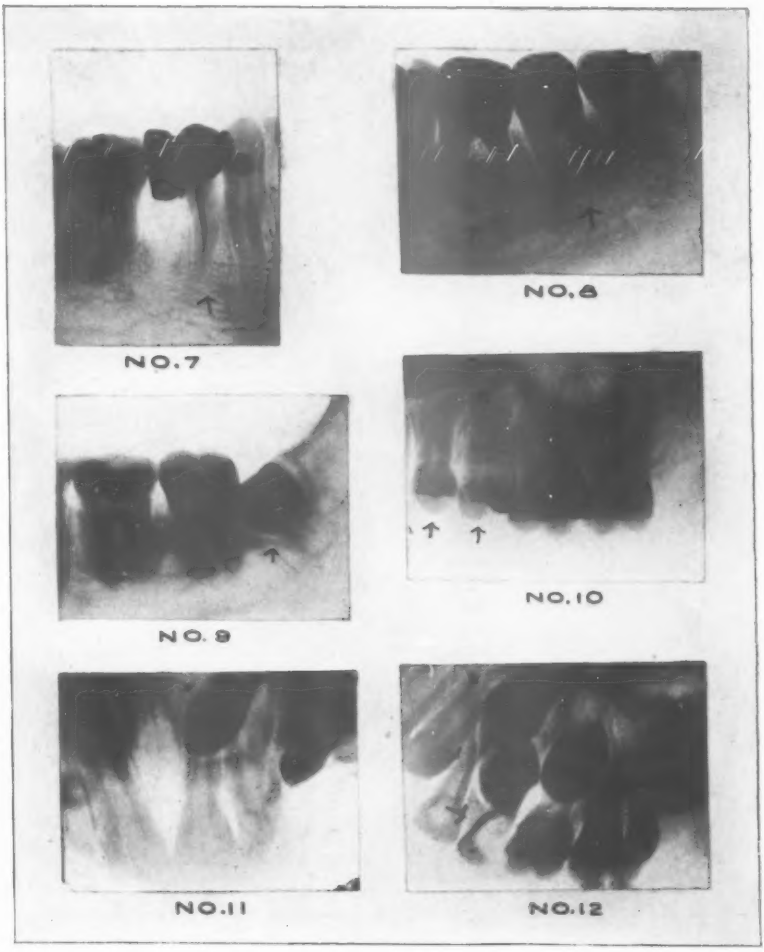
In making a diagnosis in the preceding case it is useless to attempt to draw any lines between neurasthenia, psychasthenia and melancholia. The patient presented well-marked symptoms of all these conditions, and a diagnosis of each would be fully warranted if the symptoms of the other two had been absent. The doubts and obsessions of the psychasthenic, the fatigue and nervousness of the neurasthenic, and depression of the melancholic were present in about equal degree.

In the fourth patient emotional disturbances were even more severe, her melancholia being associated with profound delusions, and mental control and insight practically lost. The patient was a well-nourished woman of about 40, not anemic, but of pasty color. She was first seen in October, 1909. She had then been in an asylum for some months. She had always been rather nervous, but otherwise well until eight months before. She then began to have delusions, that she had valuable papers, and that detectives were watching her to get them, that her relatives were conspiring against her, that her umbilicus was inhabited by her mother's soul, and many other insane ideas. She was constantly haunted by the thought that everything that happened to her had already taken place, and that her conversations were duplicates of former ones. She was excitable, talked volubly, cried readily and almost incessantly, and thought that she had been abused by various people. Examination gave negative results except in the maxillary and pelvic regions. It was found by skiagraph that the right lower second bicuspid and first and second molar teeth were dead and

irritated at the root; the right upper lateral incisor had a large abscess at the root, the upper left second bicuspid and first molar were badly decayed; the upper second molar looked as if it might possibly contain a pulp nodule; the left lower first bicuspid was dead and not filled to the end of the root. (Figs. 7 and 8.) These with the useless right third molar were extracted. The left upper second molar was found to contain no pulp nodule; otherwise the findings corresponded with the skiagraphic indications. Following the extraction mental improvement began and was steady for two and a half weeks. The uterus and ovaries were then extirpated by Dr. W. H. Humiston. The uterus was large and hard, and firmly bound down by adhesions. Both ovaries were sclerotic and cystic. Following the operation there was an immediate cessation of the crying, and the patient was cheerful and gave expression to no delusions. Lobar pneumonia developed on the second day after the operation. The patient, however, recovered from the pneumonia and gained steadily in strength and physical health and in emotional stability. She is now well and strong physically and mentally.

In this patient in addition to symptoms of melancholia and psychasthenia mental failure was sufficiently marked to suggest a probability of beginning dementia. The case was one of many in which the mixture of mental symptoms makes it necessary to determine the diagnosis by prolonged observation, in this instance fortunately cut short by her recovery. I am disposed to attribute greater importance to the pelvic than to the dental conditions in this case, but neglect of either would have probably resulted in therapeutic failure.

Many cases of functional insanity occurring during the period of adolescence end in dementia. These unfortunates constitute the majority of the life-long residents of our asylums. They may conveniently be called cases of adolescent insanity, or by the less familiar term coined by Kraepelin, dementia precox. The symptoms vary widely, including first and last almost the whole gamut of mental and moral aberration. The condition represents the severest mental involvement arising in youth, as imbecility does during the period of childhood, and senile dementia in old age. The



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symptoms of these three varieties of aberration differ by only so much as the infantile mind differs in reaction from that of the young, and this from the mentality of the aged. The problems of these conditions in their relations with irritative disease have been discussed elsewhere. In this paper it is practicable to give only an illustration of the lesions occurring in a case of dementia precox, and in one of imbecility.

The dementia precox case was in a young man in the twenties, in whom the symptoms were incoherent talk, insomnia, great restlessness and a destructive tendency. He tore his clothing and blankets, his consciousness was much clouded and he had many delusions. Inspection of the teeth showed an evident impaction of the lower second bicuspid. The upper left cuspid tooth had apparently at some time been extracted, and the right upper cuspid was present as a decayed stump. It was decided to take skiagraphs only in the molar regions. Skiagraphic examination was carried out with difficulty, and came near to failure from lack of thoroughness. It showed, in addition to the foregoing lesions, both lower third molars impacted at almost a right angle (Fig. 9), and the right upper first and second bicuspid teeth in an advanced condition of exostosis. (Fig. 10.) Close inspection of the film of the latter region showed a curious structure in the upper lefthand corner, looking like a tooth partly visible, lying horizontal. A film covering the front of the upper jaw on both sides was then taken and disclosed both upper cuspids impacted in the roof of the mouth. (Fig. 11.) The pressure of the right cuspid had undoubtedly been instrumental in causing the exostosis of the adjacent bicuspids. It was necessary to extract all of the affected teeth, seven in number. Extraction of the cuspids was difficult and bloody. The patient made a good recovery and is carrying on his usual avocation.

The lesions occurring in imbecility are likely to be multiple, corresponding with the severity of the disease, and to involve the teeth near the front of the mouth, as the symptoms usually appear early. Impactions may be right-angled or nearly so, as at later periods of life. There is, however, one rather more characteristic dental displacement, of which the following case furnishes an instance.

The patient was a girl of nine, unable to learn in school or to play with her fellows, and with attacks of nervousness, ungovernable behavior and dirt-eating. Skiagraphs showed the upper cuspid on each side directly above the first bicuspid and impacted against it. (Fig. 12.) Below the bicuspid was the first temporary molar, much decayed. In July, 1909, the temporary molar and the bicuspid were extracted on each side to allow the cuspid to appear. The mental condition has since improved, and the nervousness and dirt-eating have disappeared. The child now plays normally with the other children. This case was reported in August, 1910, in the Edinburgh Review of Neurology and Psychiatry.

Ever since the study of insanity began the psychoses have been known to develop as a consequence of disease of all kinds, and of practically every organ of the body. Mental recovery has occasionally followed cure of these lesions. Such cases have usually been chance observations, but more or less successful efforts have beeen made to connect some of the psychoses in a causative way with pelvic, ocular and renal disease. To make such knowledge available for diagnosis and cure of the individual case, an explanation of these facts must be sought in a theory sufficiently comprehensive to include them all.

Three different conjectures have hitherto been thought to furnish the most probable explanation; that the psychoses are due each to a special poison as yet undiscovered, an autotoxemia; that they are caused by mental stress, usually if not always sexual in subject matter, in the form of mental traumata suppressed as conscious memories; and third, that they are due to a hereditary defect in mental make-up, a viciousness in the blood or the brain, constituting one of the many varieties of degeneracy. We may dismiss this last as too vague to require comment.

The two remaining theories represent the physical and the psychic views of causation. In considering the probability of a single and invariable cause, whether physical or psychic, for a purely mental symptom-complex, it is to be observed that we are reckoning with the highest and most complex reaction-

mode possessed by any tissue in the body. It is the function of the ganglionic masses as the organ of mentality to give at different times and in different individuals varied responses to similar stimuli. In this lies the difference between these reactions and those of simple reflex and automatic response, those being comparatively uniform. While emotional and intellectual responses to certain stimuli become habitual and more or less alike in large numbers of people, through similarity in education and environment, these reactions are in no sense specific, but are readily and often quickly changed even by influences which may seem trivial. The sight of a levelled revolver awakens fear in many men, it arouses others to fury. A cat that gives pleasure to one, causes mild disgust in another and the wildest alarm in a third. Associations of thought vary as widely as do those of emotion. These chains of association are ever mobile. Their paths are quickly closed and opened by a great variety of determining factors. Ether or jam, although inoffensive or even pleasant, is made disgusting by a single overdose. The sight of blood causing faintness and nausea becomes a matter of indifference after attendance at a few operations. The sound of cannon inspires no fear after a few battles, except in the coward whose panic is intensified by repetition. Illustrations of this point might be made endless. Such instances are too familiar however to require further elaboration.

A similar variety is seen in the way in which different people bear the doubts and troubles incident to even ordinary existence. Many overcome mental stress most easily by ignoring, and as nearly as possible forgetting their difficulties. This reaction-mode is the one appealed to by the Christian Scientists. Others find relief by recognizing their troubles and outfacing them. This opposing principle is the basis of the cathartic method so carefully worked out by Breuer and Freud.

With regard to the theory of a specific toxin it should be easy to estimate its probability. It is a significant fact that irritant poisons, and even mechanical irritants, are capable of initiating emotions and mental processes not to be distinguished from those caused by purely psychic stimuli and

impressions of special sense. Depression after a financial loss is the counterpart of that following influenza, or of that accompanying alcoholic or septic intoxication or surgical shock. Either of these factors may, instead of causing depression, give rise to elation, to irritability, or to mistaken and delusional notions.

Poisons are among the commonest causes of mental aberration of all kinds. In view of the fact that morphin deadens pain, that diphtheria causes neuritis, that the toxins of malaria and typhoid produce delirium, poisons are thought to have usual or habitual effects, which may be relied on and may furnish the basis of speculation. Grasping this less than half-truth the broader fact is lost sight of, that diversity of reaction is characteristic of the higher modes of nervous response, and becomes progressively greater as function becomes more complex. Man is capable of mentality by virtue of this very diversity of reaction. Among all the known poisons, chemical and autogenous, there is not a single one which elicits a uniform psychic reaction. Suppose a patient in hallucinatory delirium, seeing reptiles and insects, and wild with terror, or again in a state of incoherent rambling and incapable of mental effort. It is not necessary in either event to determine in minute detail the exact mental content and its antecedents in the history of the patient's acquirement and experience. The vital thing is to determine whether alcoholic or typhoid toxemia is responsible, whether malaria, diphtheria, surgical trauma or other irritant is the underlying physical state. The cause remains the same, whether the patient is jovial in the tavern or weeping on the curb, whether he is in terror, or incoherent, bellicose or expansive.

Coming now to the subject of the psychoses the same diversity of reaction observed in the genesis of normal mental states and in conditions of delirium is found to obtain without exception in all insanities of known cause.

Alcohol in its remoter and more enduring results on mentality is responsible for many cases of insanity, and may well be used as the type of the toxins productive of mental symptoms. The report of the Manhattan State Hospital reflects

the most recent professional opinion with regard to classification. The symptom groups expressly included among the alcoholic insanities in the report for 1909 are classified as: acute hallucinoses, Korsakow's syndrome, paranoid states, delusions of jealousy, chronic hallucinoses, delirious and confused states, and deteriorations. Of these there are in all 91 cases. The statement is made that alcohol plays an important role in many other psychoses, for instance, mania and melancholia, so that many additional chronic alcoholics are placed in the group of manic depressive insanity. In some cases the alcoholic psychoses present the symptoms of dementia precox. These cases are in the Manhattan report sometimes placed in the alcoholic group, sometimes classified under the head of dementia precox.

Paresis is one of the best-known of the organic insanities, and with as well-defined a lesion and consequent symptom-complex as has any aberration of organic origin. Its typical lesion is in different cases the cause of expansive and depressed emotionality, of delusions of grandeur, personal shame, disgrace and persecution, as well as of the catatonic condition with its varied states; and with this variety of clinical manifestation the disease remains paresis.

The same diversity obtains among cases of insanity caused by psychic shock, fatigue, worry, and every kind of mental stress as among those caused by poisons. A great grief or sudden fright may result in either mania, melancholia, or delusional or hallucinatory insanity with no features distinctive of the origin of the symptoms. Financial loss and sexual trauma, overwork, grief and excessive joy when they cause insanity have no specific result, even no usual result in consequent aberration. These insanities of known origin are as mental states not distinguishable from mania, catatonia and the like, whose origins are still in doubt.

The importance of mental traumata and strains in causing insanity must be readily apparent to even a casual observer of the insane. That this special mechanism is operative as an efficient and continuing determinant of a severe psychosis in any given case requires in proof something more than the

presence of disjointed references to past troubles in the talk of the patient. Curative results by mental purging, if not due to suggestion, would be demonstrative, but they have thus far been confined to such nervous and mental states as are amenable to other hypnotic methods.

The theory of an exclusively sexual origin of dementia precox and other major psychoses is an inference from observations made on hysterical cases. It rests on a misapprehension of the strength and importance of the sexual instinct. It is easy to overrate the significance of this function. Necessary as it is for the perpetuation of the race, this perpetuation is equally conditioned on the survival of the individual through years of non-sexual life. Sexual feelings, far from being predominant, habitually give way to intense fatigue, hunger, physical illness and many other conditions vital to the individual. The insane often give freer utterance to their thoughts than do the sane, and especially in cases of mania and dementia precox this brings sexual thoughts and memories to frequent mention, but if one gives such utterances their face value without special interpretation sexual matters are not remarkably common objects of comment even with patients of this class. Assigning to the sexual field the highest possible importance, it cannot furnish the cause of any one symptom complex in all cases. Unless insanity is a special creation, not derived from the ordinary workings of mentality, it must be governed by the same laws of diversified reaction that obtain among the sane.

It remains to suggest a working theory of the psychoses, if any can be found in connection with the cases here cited and the earlier cases of the series reported elsewhere. This is possible by excluding all factors not common to all of the cases, leaving as essential the characteristic which is present in all of them alike.

Considering the cases due to physical causes, any organ of the body possessed of sensory nerve-endings is capable, under the influence of irritant disease, of setting up mental aberration, varying in severity according to the circumstances of the disease and the equation of reaction of the individual.

Again, considering, not the location nor the particular organ involved, but the kind of lesion, it matters not whether it is a chemical or mechanical agent, an organic or inorganic irritant. The only quality which we can predicate of disease which causes aberration in the emotional or mental sphere is that it involves a stimulation of nerve-tissues, either applied locally at their endings in the viscera and other organs, or reaching those endings by way of the blood-stream.

Mental excitants seem at first sight to have little in common with physical irritants. They have, however, an identical result on nerve-tissue; they excite it to activity, with sufficient power finally to produce exhaustion. The identity of the mode of action and result of these two corresponding excitants of the brain is recognized in medical phraseology; mental stimuli, mental traumata, and psychic shock are as freely referred to as are those of physical origin.

The result of mental and of physical trauma is the same not only on the mental, but on the body-processes; vascular, cardiac and visceral conditions caused by grief, fright and other profound emotions are clinically indistinguishable from those due to crushing injuries. The result of the various forms of peripheral irritation on the brain-cells has been quite recently investigated pathologically by Crile, and he has found the changes in the cells to be identical, whether they are caused by trauma, toxins, or psychic shock. The only quality common to all of these determining and exciting causes of aberration is that they are irritant stimulants of nerve-action. As all activity of nervous tissue has its origin and determining cause in stimulation by irritants, so overaction has as its cause overstimulation. Overaction is the primary and essential element of the psychoses. Defective or deficient action is produced in them as a secondary effect by inhibition or later by exhaustion.

No doubt irritants of some kinds and in particular locations are more often efficient and enduring causes of aberration than others. Although I am thus far able to report recoveries from dementia precox due to disease in only the one locality,

the fact that pelvic, digestive, and other disorders are causative in cases of manic-depressive insanity creates a strong probability that other irritants besides the dental ones will be found causing the dementing psychoses also, whether of the childish, adolescent or senile varieties.

Demonstration of the above considerations in breadth and in detail would require more exhaustive consideration than is possible within the limits of this paper. These illustrative cases are selected from a series comprising an experience mainly in the fields of pelvic, digestive and dental irritants. The scope of the inquiry might be indefinitely enlarged. It is advisable to make a beginning with cases adapted to the ready bringing of curative results into clear relief; and in which irritations may be removed with ease and some assurance of completeness. To this end early cases of the dementing psychoses of childhood and adolescence may well be chosen, on account of their hopeless outlook under expectant treatment. Cases with dental lesions as their main causative factor are among the best for demonstration, as irritants in that region in a comparatively large proportion of cases may be readily found and easily removed.

DISCUSSION.

DR. W. C. HILL, CLEVELAND, OHIO.

I have seen some of these cases, both before and after the correction of the dental abnormality and the results have been just what Dr. Upson has told us they are. We all know what eye strain and adenoids will do, and there is no reason why any abnormality or irregularity of the teeth should not have the same clinical bearing. I remember distinctly one case in which impacted teeth were removed and the patient, a child, made an excellent recovery. I am fully convinced that irritation coming from the dental organs is equally as disastrous as the irritation caused by eye strain.

DR. HENRY K. PANCOAST, PHILADELPHIA, PA.

This paper was particularly interesting to me, first, because I had two of Dr. Upson's cases, and, second, because during the past year I have done more dental work than anything else, except perhaps cases of fracture and urinary calculi.

The first case of Dr. Upson's which I saw was rather a startling one. I did not know what the type of injury was, but I succeeded in getting a number of films after many trials. There is another field somewhat allied to this one, and that is peripheral irritation causing obscure neuralgic pains. One of Dr. Upson's patients was of that type. Since he began this work, I have had a large number of cases of peripheral irritation causing such obscure neuralgias. This is a large field, one which we have only just entered.

From the roentgenologic standpoint, it is exceedingly important to make not only plates but films also of these dental conditions. By means of the film one may quite often discover something in the plate that would not have attracted attention, and which would not be shown properly in the film because of the very limited area which it covers.

Just before leaving Philadelphia I was asked to examine the head of a patient for a possible brain tumor or an old fracture. The patient complained of persistent headaches. I refused to make the examination in this way, knowing by experience what might be caused by dental conditions. I had Dr. Cryer, our oral surgeon, examine the patient first, and he suggested making an examination of the teeth and antra. I did so, and found an impacted molar in the upper jaw; also one in the lower jaw, and disease of the antrum on the same side. Therefore, in this case the diagnosis was easily made, although without a skiagraph the case might have gone on without being properly diagnosticated.

DR. FEDOR HAENISCH, HAMBURG, GERMANY.

I recall distinctly an experience I had with a lady who complained of severe pain in the trigeminus. She was treated by various physicians for about seven years. She lived in South America, but came to Germany to get relief.

She saw all sorts of doctors and was operated on several times. All her upper teeth on the side affected had been extracted and the antrum had been opened and drained. She was sent to me for examination to find out whether she had an empyema of the left antrum, or disease of the ethmoid. I examined her thoroughly, but could not find anything wrong except some abnormal structure in the bone over the antrum, which I thought might be the cause of all her trouble. I compared these plates with other head plates which I had, and I finally found two plates which showed the same condition. Then I found a skull in the Anatomical Museum which helped me very much to make a diagnosis. I concluded that this could be nothing else than an anomaly of the nerves on the affected side of the face, which had been extracted to stop the neuralgia. Then I decided to examine the mouth, knowing that neuralgia might be started by some dental condition. I made a film and found a part of a root—I think it was the first bicuspid, imbedded in the jaw. That root was removed, the patient was relieved of her pain within a week, and it has never recurred. She had suffered from this trouble for seven years, had been treated in every possible way, and yet secured no relief until this root was extracted. Therefore, it must have been the root that was causing the trouble.

DR. CLARENCE E. COON, SYRACUSE, N. Y.

This paper was particularly interesting to me because for two or three years I have been considerably astonished at the number and variety of symptoms which may be caused by an impacted molar. Painful and painless dental conditions are certainly responsible for much suffering. It is a good thing to look over the teeth in cases of obscure conditions where there is trouble about the head. I have never had a case of dementia precox to examine, but I have had a variety of cases which were easily understood when a skiagram was made.

One of the most interesting cases I have had was that of a boy, seventeen years of age, who had a persistent tor-

ticollis in spite of every and all forms of treatment. A radiograph in that case showed the third molar in a horizontal position on top of the roots of the first and second molars. The tooth was extracted and the boy made a splendid recovery.

A few days ago I saw the case of a young lady, twenty-eight years old, who had been suffering for over two years with a dilatation of the left pupil. Her general health was good and the third molars were all in their proper places, except in the upper left jaw, where the skiagram showed an impaction. There is every reason to expect that the symptoms in this case will disappear with the extraction of that impacted tooth.

DR. E. W. CALDWELL, NEW YORK CITY.

I want to ask Dr. Upson what proportion of his cases of impaction have mental symptoms? I know there are many cases in which there are no mental symptoms, but I wondered how often this does occur.

DR. W. F. MANGES, PHILADELPHIA, PA.

I have had occasion to do considerable of this work, and I am convinced that we have not paid enough attention to these cases. The surgeon never thinks of the teeth as causing any of these troubles. I had a case of this kind, where both lower molars were at an acute angle with the molar in front, but the apex of the angle was directed downward, that is, the crown of the third molar was resting against the root of the second molar.

Another instance was that of a lady who had a bicuspid extracted, but a portion of the root remained in the jaw and produced neuralgia. The surgeon removed this root, but the neuralgia continued. She was brought to me for further examination and I made a number of films. On the first skiagraph was a small semicircular shadow, very thin and very faint. It was not near a tooth. It looked like a foreign body. I made several more films and on each one I saw the same shadow. I did not know what it was, so I con-

sulted an oral surgeon, who told me that it might be some instrument that had been left in the jaw. He operated and removed a single thread of gauze, which had evidently been left there after the removal of drainage. It was coated with calcareous material which accounted for the faint thin shadow I saw. The patient made an immediate and perfect recovery.

DR. GEORGE H. STOVER, DENVER, COLO.

I would like to ask whether in any of these cases where there was a suspicion of brain tumor an ophthalmoscopic examination of the eye showed any change in the optic disc?

DR. GEORGE C. JOHNSTON, PITTSBURG, PA.

I have seen a number of cases, none of which have given rise to mental symptoms as pronounced as those described by Dr. Upson, but I have seen quite a number of nervous wrecks—women always—that were directly due to impaction of teeth. One case in particular, where there was impaction of a wisdom tooth against a molar, and on extraction of the molar the unerupted wisdom tooth, which was lying transversely in the jaw, was pushed into the antrum and remained there for some time before I could succeed in getting anyone to go in after it. They thought the tooth had been absorbed, although I had plates which showed its position in the jaw exactly. After a year the tooth was removed.

In making these examinations it is my custom always to use plates first and to examine both sides of the mouth. I include the jaws as far backward as the bicuspids. The films are used to show the jaws from the bicuspids to the incisors.

DR. GEORGE E. PFAHLER, PHILADELPHIA, PA.

Most of my work in private practice at present is examination of the teeth, and I think it is due in part to the fact that Dr. Upson has awakened the interest of the profession in this condition of the teeth as a possible cause of nervous affections. One of the first patients sent to me was a theological student who had been advised that he was suffering

from dementia precox and that it would be necessary for him to discontinue his college career. He was having some trouble with his teeth and he was referred to me for a radiographic examination. I found an abscess at the roots of one of his molars. This was treated and a cure effected. A month later the father of the student reported that he had improved decidedly, and returned to college, and had not had any further disturbance.

There is no doubt in my mind that I have seen enough cases to be convinced that trouble in the mouth is the cause of many of these nervous conditions. However, we must bear in mind that every case of nervousness or dementia precox is not due to the teeth, and that this is only one part of the body which should be investigated in every one of these cases. When a patient of this kind is brought for examination we must not stop with the examination of the mouth and jaws, because we often find a lesion where it is least expected.

One patient referred by a dentist knew that one of his teeth was in bad condition because there was pyorrhea about the borders of that tooth. He had had attacks for ten years. I made a complete examination of all the teeth and instead of finding only one abscessed tooth there were six others in the same condition. Therefore, we must make these examinations complete.

I feel very strongly on this subject, that these cases are not thoroughly investigated, and it is our fault that it is not done.

With regard to the technic to be employed, I know that we can examine the front teeth with plates equally as well as we can the back teeth, especially the teeth in the lower jaw, by twisting the head strongly to one side or the other, so that the anterior portion of the jaw is brought squarely on the plate, and the rays are sent through the jaw from before backward. In that way you can bring out the shadows clearly. You get greater depth than you would when a film is used. The examination of the anterior teeth by means of films is difficult. One of my patients had a brother-in-

law who had suffered from nervous symptoms for eight or ten years. I made a skiagraph and found impacted molars. The patient's mother had had impaction and abscesses.

DR. UPSON (closing the discussion).

The case of the lady reported by Dr. Haenisch is very interesting and suggestive, as are the cases reported by the other speakers. One of the most striking cases of this kind I saw about six or eight months ago. It was a child eight years old who began to have neuralgia in the left side of the face. It grew worse and worse, in spite of the fact that all the available remedies were tried. Finally she was kept under the influence of chloroform for a great part of the day. This went on for six weeks, when I saw her. Apparently the pain had begun in some of the teeth in the upper jaw, and had later become generalized. Skiagraphs were made, and some of the temporary teeth had been extracted, but to no purpose. I had more skiagraphs taken and found two conditions. There was in the upper jaw a crowding of the teeth. That was relieved by the extraction of one bicuspid. The first permanent molar had a large cavity. Under ordinary circumstances I would have had the dentist fill it, but the case being urgent I felt it advisable to have it extracted. This was done, and the child has had no pain since. The decay was found to have reached the pulp, and there was in addition a large pulp-stone.

Widely diverse symptoms are at times the result of dental irritation. A man whom I have known for thirty or forty years began three years ago to have severe pains in his stomach. The attacks resembled those of gall-stones. His physicians gave him morphine and controlled the attacks as best they could. Nothing radical was done, however, until after two years, when he had two or three old roots extracted which were badly decayed and had bothered him a great deal. The attacks inmediately ceased and have not recurred.

Dental pain is said at times to shoot down into the arms and legs, but apart from local pain the pain which is most common in these cases is headache. I have had a number of

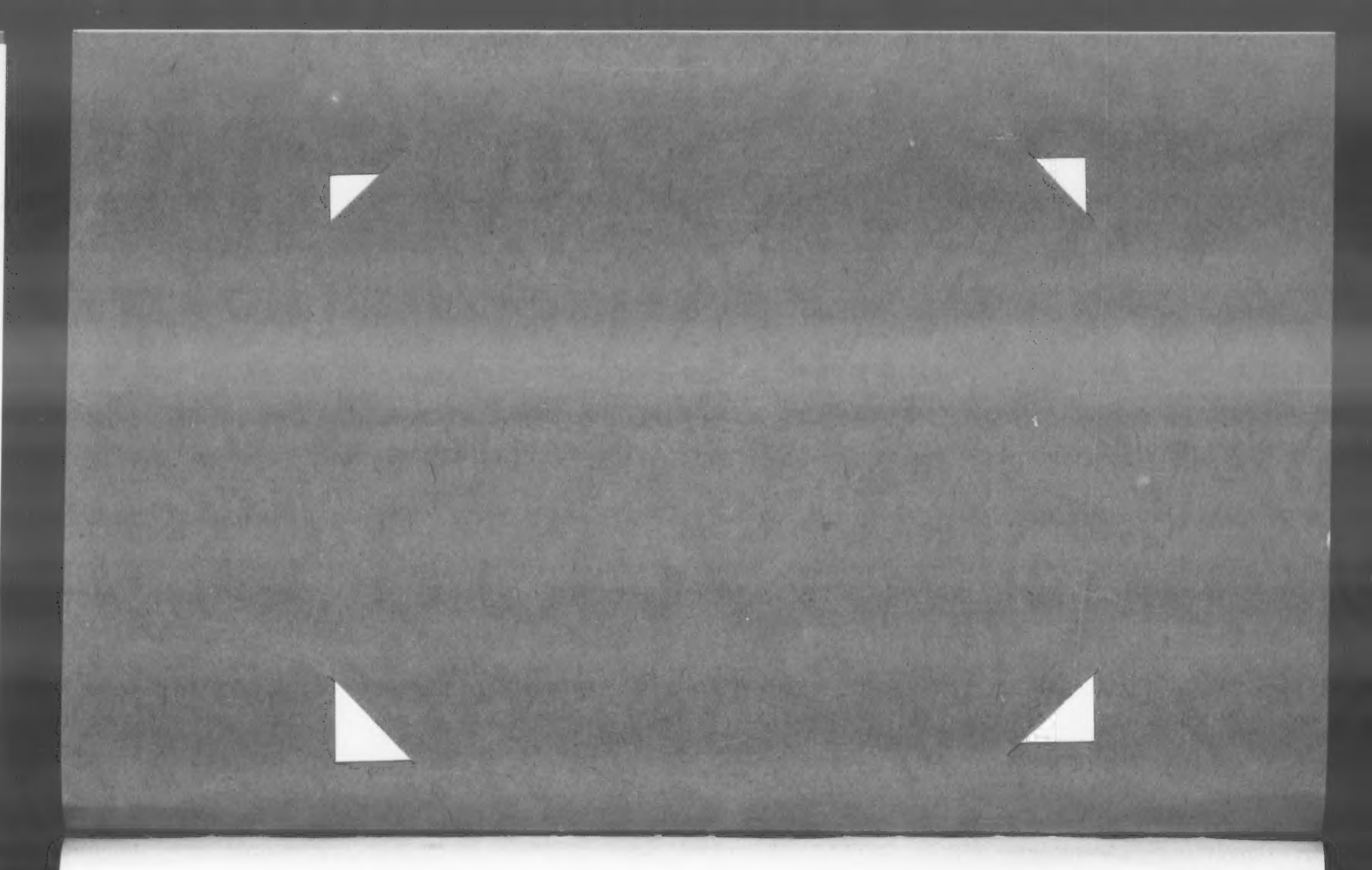


FIG. 1

BLASTOMYCOSIS OF THE METACARPAL AND PHALANGEAL BONES—HOLLISTER E. POTTER

cases of headache in which very gratifying results followed the removal of decayed teeth or roots.

As to Dr. Caldwell's question, I do not think that I can answer it. If you ask what proportion of cases suffering from severe melancholia and dementia precox show dental conditions responsible for the trouble, I would say that the proportion is fairly high. Irritation from the teeth may not cause any pain whatever, and yet produce severe nervous disturbances. Irritations caused by impaction rarely cause pain unless the superficial tissues are involved, when there may be pain, locking of the jaw, and symptoms that are quite obvious. In most cases, however, there is no local pain, although many of these patients complain of headaches and pain in distant parts of the body in addition to their mental symptoms.

Dr. Bowen asked about the bridge case. I think the appearance in the skiagraph was rather deceptive. The bony structure has been largely eliminated, but there is left enough soft structure that is pervious to the X-ray to attach the tooth to the jaw.

THE RADIOGRAPHIC FINDINGS IN OSSEOUS AND PULMONARY BLASTOMYCOSIS.

BY DR. HOLLISTER E. POTTER, CHICAGO.

Following the clinical and pathologic reports that gross changes were found in the bones, joints and pulmonary tissues of patients suffering from systemic blastomycosis, we began five years ago to make radiographs of such suspected changes in all patients available for examination, with the purpose of observing the constancy of radiographic findings and the extent to which they were characteristic of the disease.

Fortunately it has been possible, in conjunction with clinicians and pathologists who were making these cases a special scientific study, to observe seven patients presenting more than a score of interesting and demonstrable bone lesions, to skiagraph them repeatedly at various stages of their disease, and in some cases to observe the pathologic changes post-

mortem. Eight patients with pulmonary lesions were skiagraphed, three of them showing incipient changes only. Additional and confirmatory evidence was also obtained from the gross specimens preserved from autopsies made previous to our observations.

Of the twenty-two cases of systemic blastomycosis reported before August, 1908, complete autopsies were obtained from ten. The lungs of each of these cases showed distinct blastomycetic lesions, the pleurae being affected in four cases; the vertebrae also showed changes in four cases and one or more of the other bones in six cases; in three cases certain joints were pathologic. Lesions have been recorded as occurring in nearly all the bones of the body.

In our radiographic work there have been demonstrated marked changes in the vertebrae, the ribs and the pelvis; the scapula, humerus, radius and ulna; the femur, tibia and fibula; and in the long and short bones of the hand and wrist, foot and ankle. These will be seen to include bone groups from the entire body, with the exception of the skull, sternum, clavicle, etc.

OSSEOUS SYSTEM.

The primary or constant finding in the active lesions in bone is that of localized dissolution. So intense and well-defined is this process that it results in the peculiar condition in which cavities of completely dissolved bone lie immediately adjacent to spongy bone tissue apparently intact. The fringes of bone forming the walls of these cavities retain their full calcium content until with advancing necrosis they in turn are completely liquefied. Diffuse appearances in the neighborhood of a blastomycetic focus is the exception.

These areas of total necrosis may be found singly or in groups. If multiple they may coalesce as they increase in size with the formation of a single larger abscess. They may appear anywhere in the structure of the short bones as the carpus or tarsus, and here show the same tendency to affect neighboring bones and joints by direct extension as does tuberculosis. The affected bones, however, do not show the same diffuse porosis and general decalcification as in tubercu-

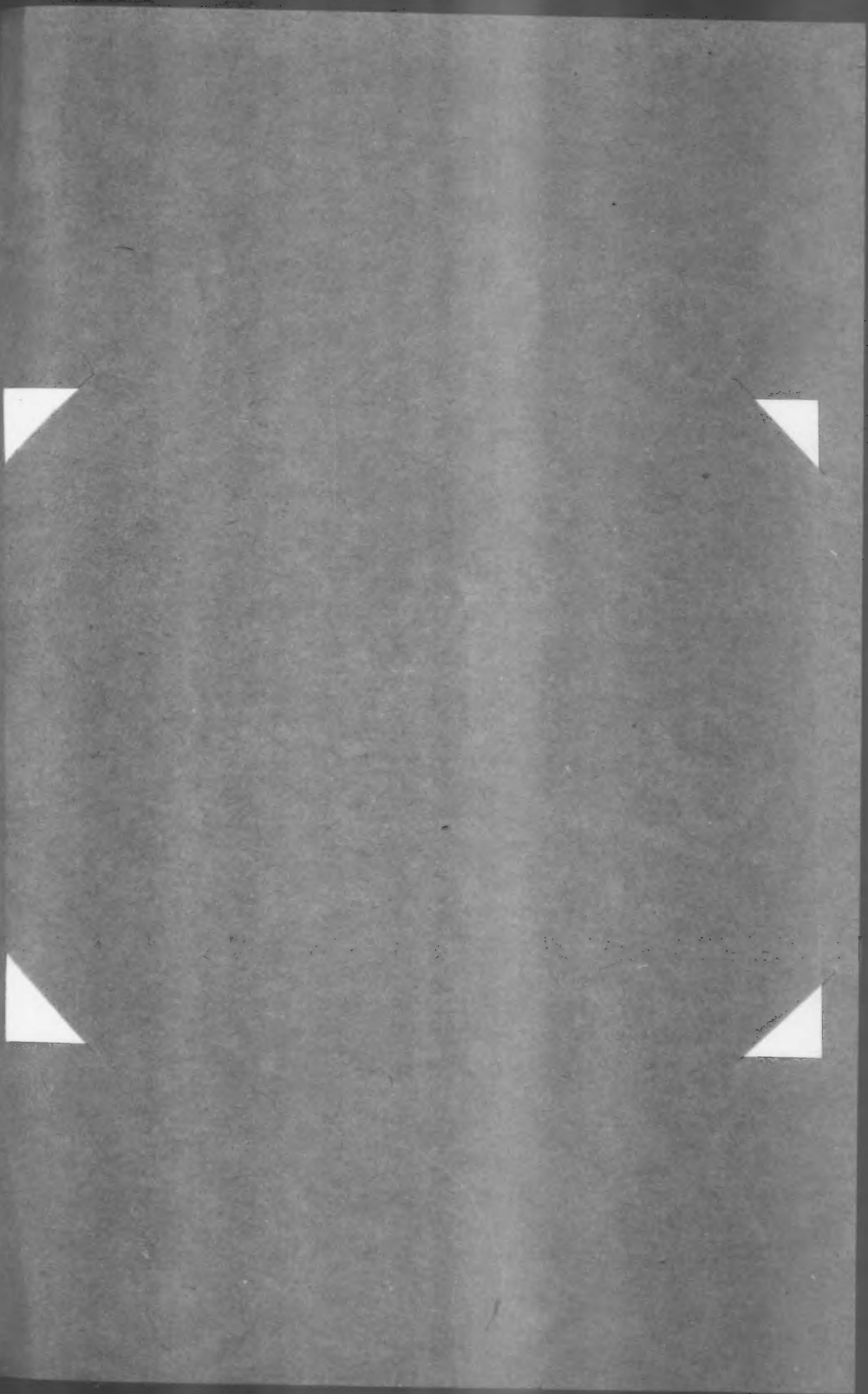


FIG. 2

BLASTOMYCOSIS OF THE METACARPALS—HOLLISTER E. POTTER

losis but are more patchy in appearance, certain bony compartments retaining their structural integrity to the last. In the long bones the foci appear as a rule in the spongy portion of the diaphysis immediately beneath the epiphyseal line, or, in the absence of an epiphysis, beneath the joint surface. In one instance observed the focus probably developed within the epiphysis.

The secondary finding of import is that of proliferation. Though frequently not seen, its presence and appearance assist materially in identifying the nature of the process, and particularly is this true in locations where the details of the edges of the focus are veiled by quantities of overlying bone or soft structures. In its typical form the proliferation is seen as a bony sheath partly or completely surrounding the end of one of the long bones within which a focus is developing. The proliferated bone is mature and homogeneous in texture, and its amount is practically proportionate to the slowness of development of the central abscess and the lateness of its rupture into the surrounding soft tissues. Thus bony periosteal formation is a sequel to chronic destruction and may be absent in lesions of rapid development.

As soon as the abscess obtains external communication both the destructive and proliferative processes are arrested. To obtain exit necrosis is seen to have advanced to and through a much thickened periosteum with the formation of cloacae. Lesions in the short, flat or irregular bones rupture as a rule before the formation of demonstrable new bone giving the primary picture of simple necrosis. Many of the deep subcutaneous abscesses so frequently seen in this disease are the result of rupture of some underlying bone lesion.

In one case almost complete healing of the bone was observed. This was evidenced by the advance of new bone upon areas previously softened, decreasing their size and walling them off by sharp hard lines. Coincident with this healing of the bone was seen a retraction and puckering of a previously active lesion in the free upper portion of the left lung. No cases of completely sclerosed bone lesions have been identified by X-rays.

The cortical portion of the long bones may become involved from without by deep extension of a burrowing abscess. In one instance the tibia showed a longitudinal furrow with a thickened margin which seemed to lie within the shaft of the bone until a transverse projection showed it to be superficial.

Sequestrated bone has not been observed radiographically except in the form of small detached fragments of spongy material resembling the fringe lining a cavity. In no case have we seen evidences of rupture of foci into the medullary cavity. The constant indications are those of external rupture followed by simple softening due to regional extension.

From a radio-diagnostic standpoint we will therefore select the following appearances as being of value in speaking for the blastomycetic nature of infectious foci in the bone:

1. The combination of sub-epiphyseal or sub-articular focus of an intensely localized character with a mature and homogeneous periosteal sheath around it. This is the most distinctive appearance and is commonly seen in lesions of the long bones.

2. Lesions of the spine show the same patchy appearance that is found in the short bones of the wrist. A marked destruction of the vertebral bodies may take place before a collapse of their substance occurs. This is probably due to the persistence of certain bony compartments immediately adjacent to the abscess cavity.

3. Blastomycosis in any of the bones when not accompanied by the periosteal reaction shows a maximum of localized destruction with a minimum of porosis or partial decalcification in the neighboring bone.

We realize that the number of lesions skiagraphed has been limited and record these observations and deductions subject to the modifications or additions that further study may bring out.

THE LUNGS.

In several of the systemic cases coming to autopsy there has been found considerably more pulmonary involvement than could be detected by clinical methods during life. This, together with the fact that these lesions can easily be demon-

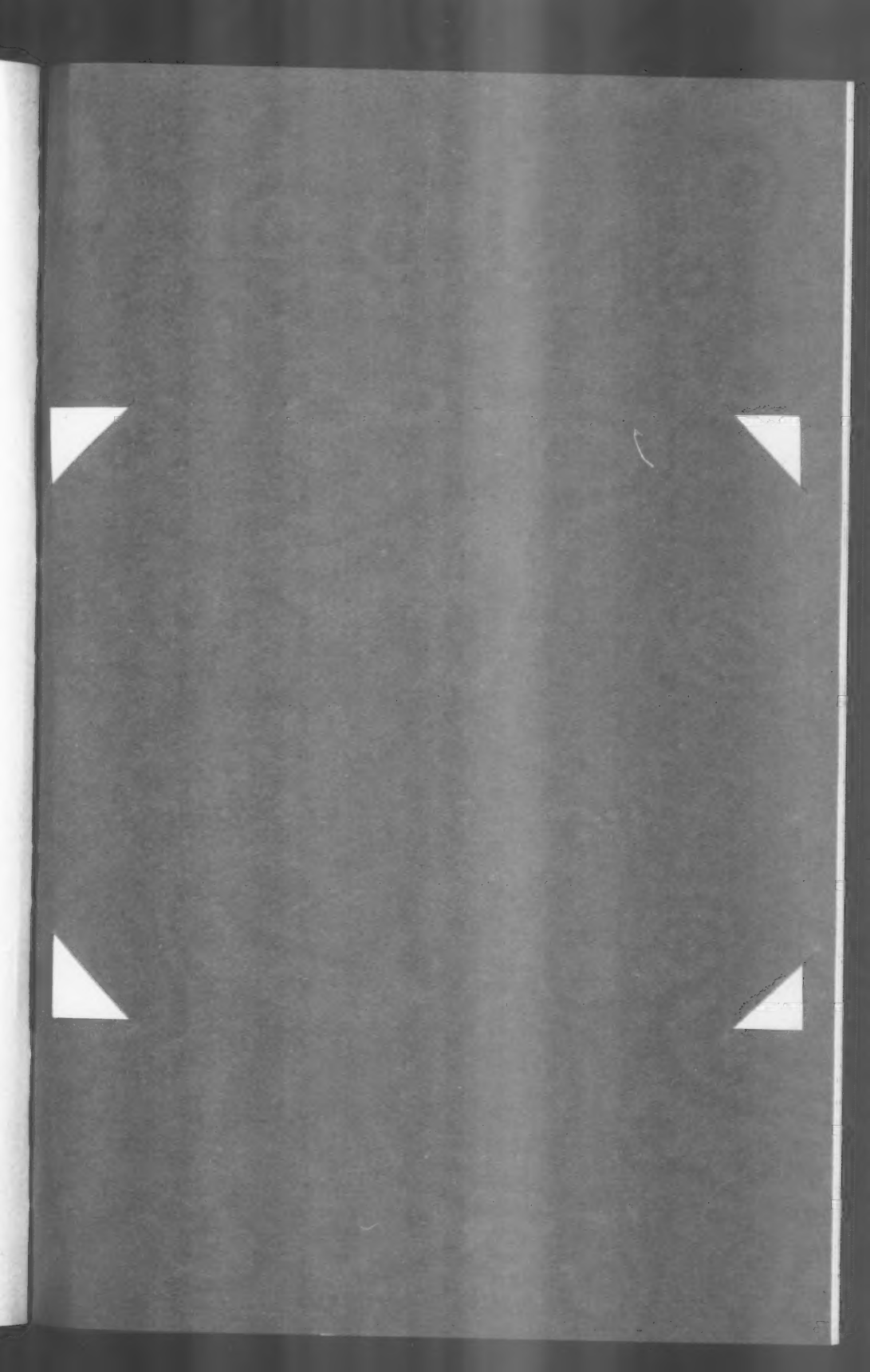
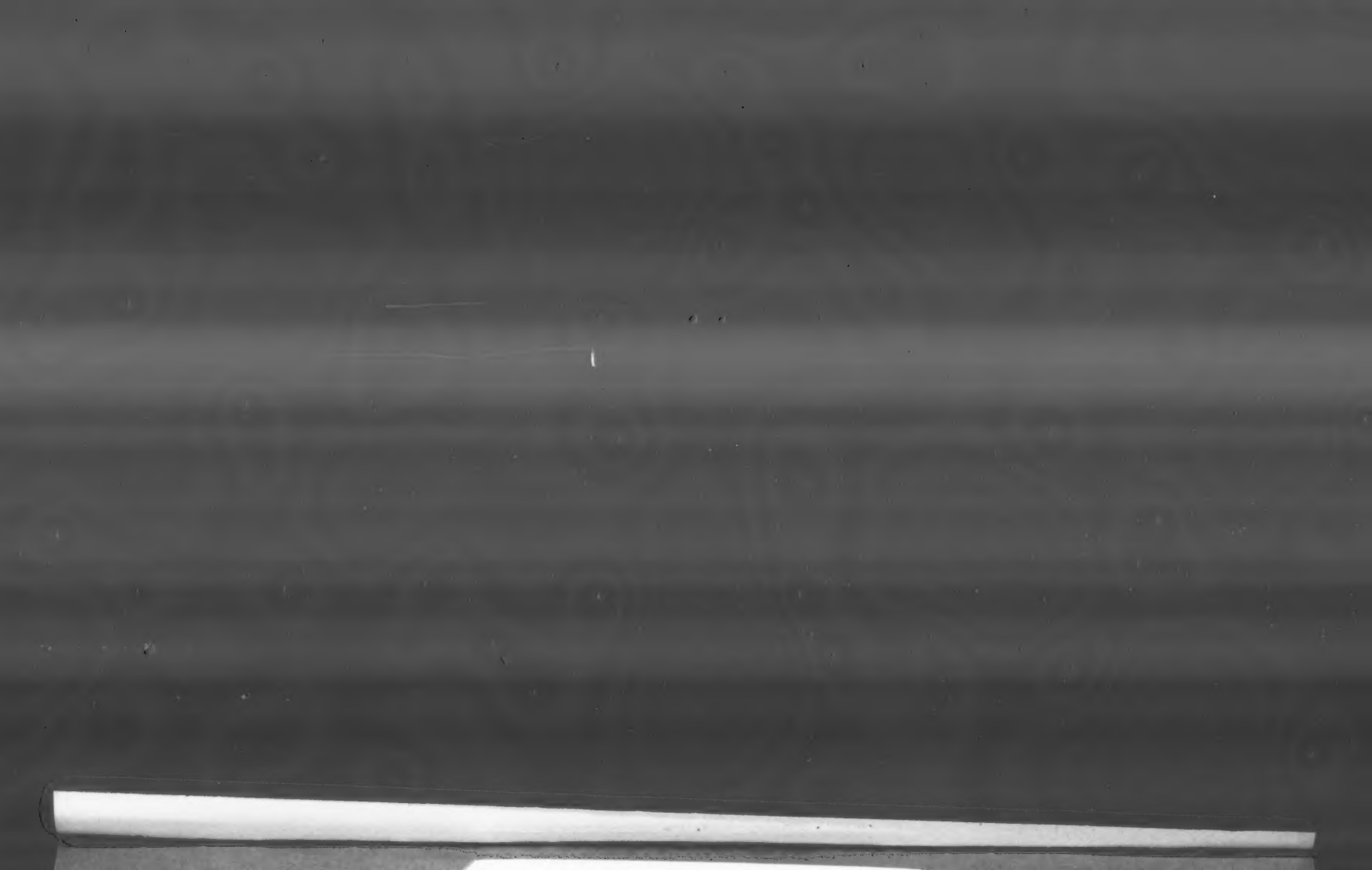


FIG. 3

BLASTOMYCOSIS OF THE ACROMION—HOLLISTER E. POTTER



strated by X-rays, suggests at once the value of radiographic methods in determining the presence and amount of consolidation.

To draw inferences as to the nature of such consolidations from the structure and distribution of their shadows seems at the present time impracticable on account of the few number of cases studied, as well as on account of their known resemblance to the gross lesions of tuberculosis and broncho-pneumonia. We will therefore limit ourselves to a brief outline of the radiographic findings, leaving the diagnosis of the etiologic factor to the microscope.

Of three cases which had definite systemic lesions elsewhere and but little clinical evidence of pulmonary involvement at the time of our first radiographs two showed light fleecy shadows grouped along the position of one or more bronchi. These shadows extended outward and downward from the root of the lung rather than toward the apex. In the other case the lung appeared normal except for one dense mass situated at the root of the right lung. This mass extended vertically along the edge of the mediastinum, had an irregular border, and gave no internal structural details. It resembled some mediastinal tumors we have seen encroaching upon the lung.

Two cases showed many masses, one-half to two inches in diameter, scattered over the region of both lungs. Each of these masses gave such a deep shadow and was so devoid of internal structure that it suggested a complete displacement of air throughout its extent. No empty cavities were demonstrated.

Another case showed these same disseminated masses, plus a very large mass of total consolidation at the root of the left lung.

In another the findings were those of simple cavity. A ring of consolidation with a few radial markings exteriorly surrounded a clear transparent area nearly two inches in diameter.

The last case skiagraphed showed no definite details on account of the extreme dyspnoea of the patient. The result, however, showed many massive consolidations throughout both lungs.

These findings support the pathologic statements that pulmonary blastomycosis is frequently bronchial in origin, and that very large masses of diseased lung, involving even the major portion of the usual air-filled space, may exist before death takes place.

I am indebted to Dr. Oliver Ormsby, dermatologist, and Dr. A. M. Stober, pathologist at Cook County Hospital, for their kind assistance in furnishing material for these observations.

AMERICAN ROENTGEN RAY SOCIETY.

Proceedings of the Eleventh Annual meeting, held at the Hotel Cadillac, Detroit, Michigan, September 29-30, and Oct. 1, 1910, under the Presidency of Dr. George E. Pfahler, of Philadelphia.

FIRST DAY—MORNING SESSION.

The Society was called to order by the President at 10:00 A. M.

The Secretary, Dr. Percy Brown, read the minutes of the preceding annual meeting, and on motion they were adopted as read.

The Secretary then read his annual report:

SECRETARY'S REPORT.

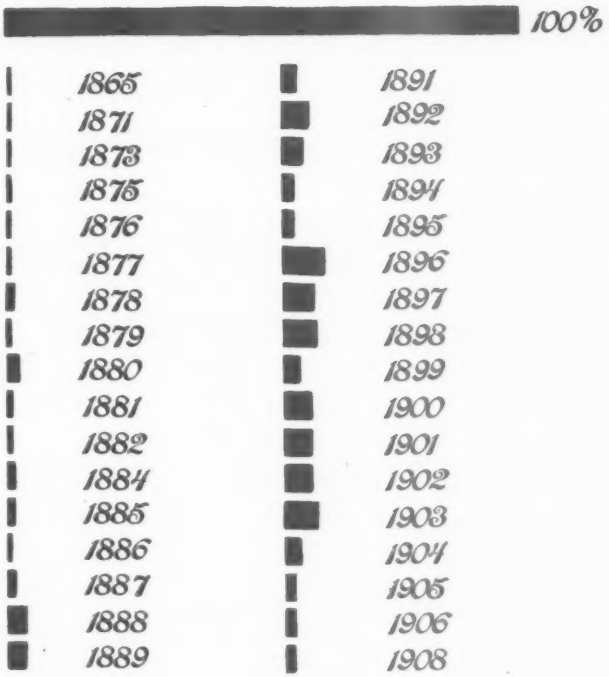
1910.

It becomes the pleasant duty of the Secretary of this organization to report a year of absolute prosperity, so far as the interests of the Society are concerned. What our increase in membership may possibly have lacked in quantity it has gained in quality. Our periodical publication, the "American Quarterly of Roentgenology," has been well received and, what is better, possesses a quality such as to merit the highest commendation. We have been in correspondence with representatives of other organizations, both in England and on

the Continent. We feel that the benign influence of American Roentgenology has become more widely felt and has tended to attract alien eyes to the work done and the results obtained by the workers of this nation.

A few months ago, it occurred to the Secretary that today

Chart I. **Date of Medical Degree**

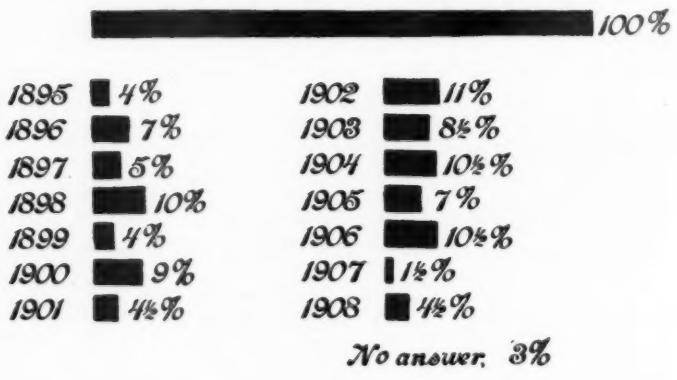


we meet nearly fifteen years since the announcement by Professor Roentgen at Wurzburg. A decade and a half, then, suggests itself as an interval during which Roentgenology in America has been brought into the world and has become, as the clinicians say, "well-developed and nourished."

The Secretary has tried to make, as nearly as possible, accurate observations upon this post-natal development, and, to further his ends, he has sent to the members a mild type of the much-despised blank-to-be-filled-out. He received answers from possibly a little more than one-half of the total membership of the Society. This, to his mind, was by no means unfavorable, when one considers how difficult it usually is to obtain responses to requests of this kind. The questions which this blank contained the Secretary feels that he is forced once more to repeat in order to elucidate the

Chart II.

"Year in which you became interested"-- &c



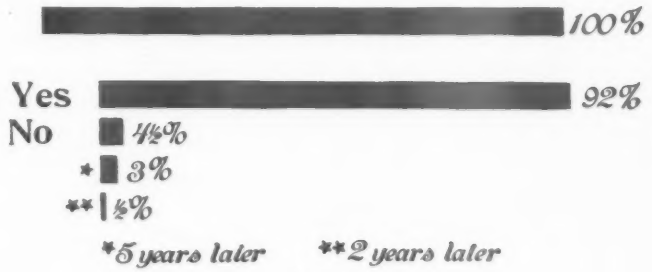
general trend of this report. In order the better to portray the nature and variety of these answers the writer has drawn a series of charts, which will now be presented seriatim.

Chart one deals with the second question upon the list, to wit, the Date of Medical Degree. This chart demonstrates fairly well the professional age of the members of our Society. It will be noticed that the first material increase in percentage takes place among the graduates of about the year 1888. Then there is a gradual decrease until the year 1895. From 1895

until the year 1903 are graduated by far the largest proportion of our membership. This, apparently, has a distinct bearing upon the date of Professor Roentgen's announcement and the marked interest thereupon shown by many young medical graduates accounts for our large percentage from 1896 to 1903. The beginning of 1904, however, the percentage again becomes small. Whether or not this is due to the fact that about that time the unquestioned dangers to which X-ray workers became apparent or not, I will leave for you to decide. To sum up, then, we can say that the majority of our

Chart III.

"Did you, at this time, take up the practical application of the Rays?"



members were graduated in medicine from the years 1896 to 1903. This represents a large proportion of our membership therefore as being well within the prime of their activity, and consequently speaks well for the future of the Society.

Chart two presents the nature of the answers to the question, "Give the year in which you became seriously interested in the Roentgen rays." On the whole, this chart is as interesting as the previous one. There seems to have been a marked increase in interest during the years 1896 to 1898. From 1892 until 1902, initial interest had somewhat subsided

Chart IV.

"Did you continue with your established work?"

Chart V

"Have you relinquished your established work?"

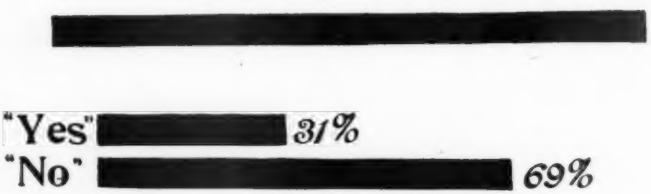


Chart VI.

"Are you now practising Rontgenology as an absolute specialty?"

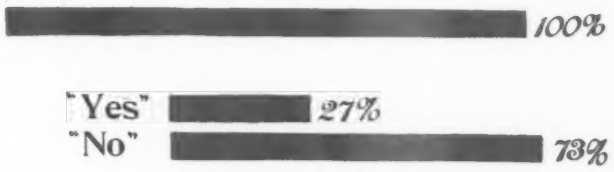
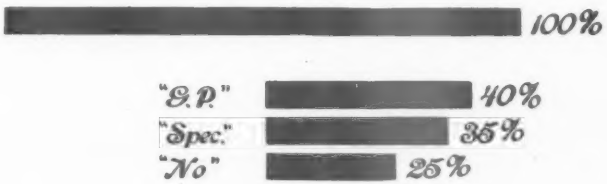


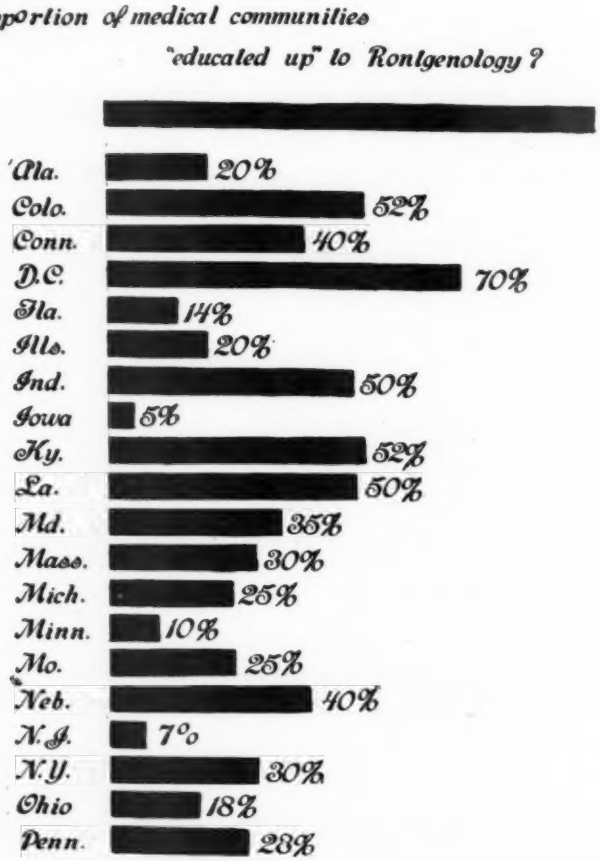
Chart VII.

"General Practice, or Specialty other than Roentgenology?"



only to light up again, however, in 1902, when the proportion reached a greater figure than it had before shown at all. You will remember that about this time the German tubes appeared on the market, as well as the Albers-Schoenberg "Compressions-blende." The improvement in the results

Chart VIII.

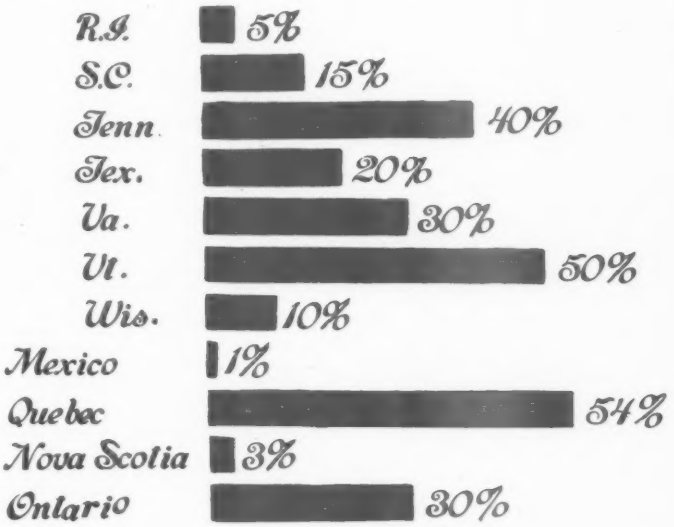


which this information brought about no doubt tended to increase general interest at this time. Just why there is such a decrease in the year 1907 is not known. It is apparently due to chance more than anything else.

Chart **three** answers the question, "Did you at this time take up the practical application of the rays?" It is interesting to note that as many as 92% answered in the affirmative and but 4½% did not. The remainder took it up from two to five years later. This indicates the absorbing interest which immediately controlled those who became interested in the art at all.

Chart **four** answers the question, "Did you continue with your established medical work?" 87% apparently did, where-

Chart VIII. (Continued)



as 13% forsook the pursuits in which they were then engaged.

Chart **five** asks the question, "Have you now relinquished your established work?" 31% say they have, whereas 69% say not.

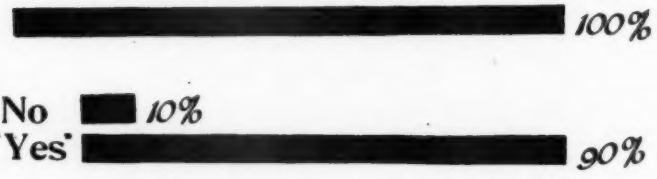
Chart **six** asks the question, "Are you now practicing Roentgenology as an absolute specialty?" 27% are, 73% are not. This chart seems to show how really few absolute specialists in Roentgenology there are in this country.

Chart **seven.** Of those who have not relinquished their established work the question is asked, "Are you in general practice, or in a specialty other than Roentgenology?" 40% say they are still in general practice. 35% announce that they are in a specialty other than Roentgenology. 25% make their reply "no." This latter reply seems to indicate that the question was ambiguous and I easily imagine it might have been misunderstood.

Chart **eight** is the most interesting one. It asks the question, "What proportion of the medical profession in your community is educated up to the value of Roentgenology?" I am obliged to tabulate the answers by states on account

Chart IX.

"Is the demand for Rontgen work increasing?"



of the vast number of medical communities about which report was made. You will see by this chart that the District of Columbia enjoys the distinction of being, so far as the medical profession is concerned, the most enlightened as to the value of Roentgenology. Mexico foots the list with 1% and Nova Scotia and Iowa follow closely at her heels. The small percentage of seven, which is possessed by New Jersey, is somewhat surprising. The most densely populated states, apparently, run about the same.

Chart **nine.** "Judging from your experience, is the demand for Roentgen work increasing?" This chart speaks interestingly for itself. 10% say no, whereas 90% say yes.

Chart X.

"Time spent in charity work?"

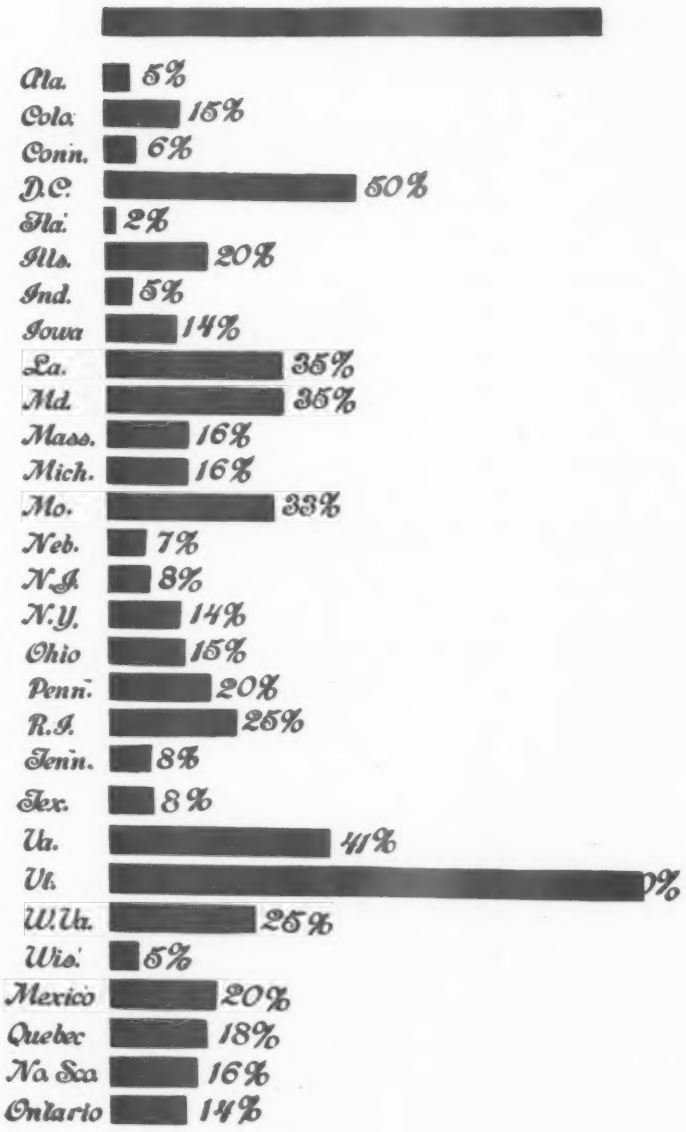
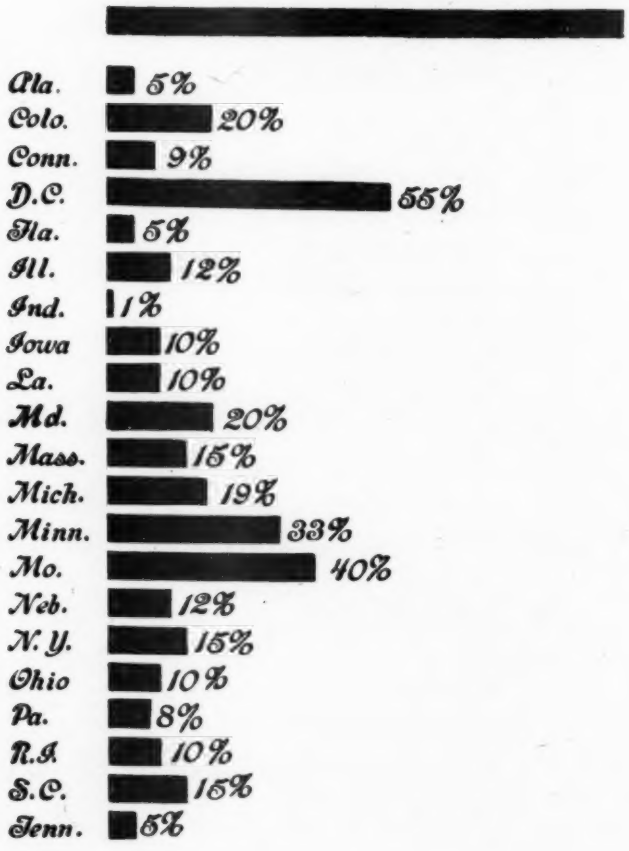


Chart ten deals with a more personal matter, "What proportion of daily time is taken up by charity work?" This question was so universally, and at the same time, so feel-

Chart XI.

"On experimental work?"

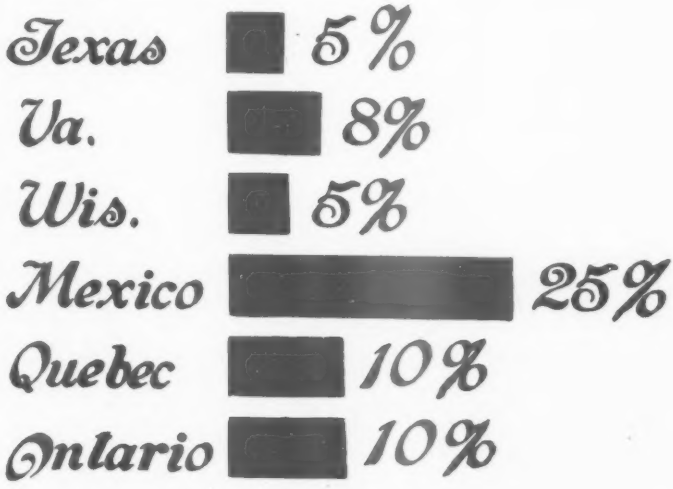


ingly answered that I have been obliged to tabulate the answers by states. The high percentage is made by one member, who frankly acknowledges that all his work is charity work.

Chart **eleven.** "What proportion of the week's time, for example, do you expend on experimental or literary work?" Indiana modestly keeps her percentage down to one.

The last chart is by no means the least. It answers the question, "In which are you chiefly interested, Roentgen diagnosis, or therapeutics?" 49% say they are interested in diagnosis, 19%, on the other hand, lean toward therapeutics. A broad-minded 30% manage to embrace both, whereas 2% are not interested in either.

Chart XI. (Continued)



I will now present a map, which shows the distribution, throughout our country, of those who are completely, or but little, interested in Roentgenology. The blue color represents absolute Roentgenologic specialists. Those in red combine their Roentgenology with the practice of general medicine. Those in green practice Roentgenology, but are interested as well in some other specialty. The yellow ones are not only interested in Roentgenology, but in the science of electro-therapeutics as well.

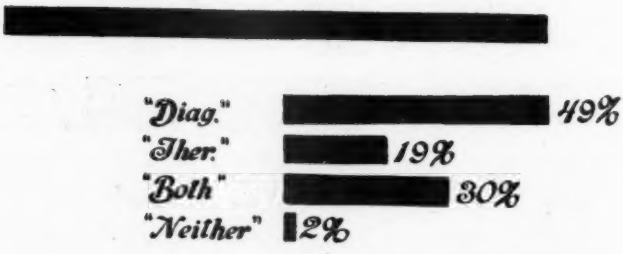
A rapid glance at the entire areas of this map suggests to the casual observer that there is still something in Horace Greeley's old advice to "Go West, young man." Compare, if you will, the state of Texas with Manhattan Island.

Seriously speaking, there is yet room for Roentgenology in the United States, and it is a hope that this map may tend to impress this fact upon your minds whenever you feel yourselves crowded.

Thus the termination is reached of the first and last appearance of your Secretary as a statistician. In view of the

Chart XII

"Diagnosis or Therapeutics?"



above effort, he might well be approached by the proper authorities with reference to a recompilation of the Century Dictionary, or to estimate the proportionate occurrence of the Anopheles mosquito in the State of New Jersey. In the absence of any such advances, however, and the persistent lack of any other stimulus to a naturally inquiring disposition, he now subsides in favor of those who are to present subjects of a character less dessicate.

Respectfully submitted,

PERCY BROWN,
Secretary.

Dr. Roland Hammond, Vice-President, then took the chair while the President delivered his annual address:

PRESIDENTIAL ADDRESS.
FOR THE ANNUAL SESSION OF THE AMERICAN ROENTGEN RAY SOCIETY, 1910.

GEORGE E. PFAHLER, M. D.

The Duty of the Public and the Roentgenologist.

Ladies and Gentlemen:

Having accepted, a year ago, the greatest honor at your command, I determined to prepare an address upon "Precision in Roentgenology," which was to involve some original research. My help-mate, who shared, and appreciated this honor as much as I, urged me to begin this work early, and reminded me of it a number of times, but before I could begin she was taken from me. Having lost my beloved wife, who was the source of my inspiration and ambition, I felt too much crushed to carry out our original plans, and gave up all idea of doing anything. This rambling talk has been prepared during the past few days, after being informed that something would be expected, and must, therefore, be looked upon as casual remarks rather than a formal address.

During the past year, our ranks have been depleted more than during the entire history of our society. Four faces, whose very presence was an inspiration, and whose company was a delight to all, will never meet with us again. We must not allow this to cast gloom over our meeting, for by so doing I am sure we would be disloyal to their wishes. Let us therefore each do our part to instil the same enthusiasm and good fellowship that has stamped our previous meetings with success.

Dr. Kassibian, one of the earliest members of the society, who did much toward making it a dignified scientific organization, and who recorded in his well-known book the results of his original researches, has been sacrificed as a martyr to

his early enthusiasm in this science. This sacrifice was the result chiefly of charitable work in a small, crowded room of a hospital, in which he did much fluoroscopic work without protection.

This sacrifice should serve to remind the public of its duty to Roentgenologists and should also remind us of our duty to ourselves, in providing sufficient protection against the insidious, though constant baneful effects of the rays upon those who have chosen this special branch of medical science. The smaller the laboratory in which one must work, the less will be the opportunity for protection.

The **public** should provide ample space for the X-ray laboratories of our hospitals. The day should have long passed when this laboratory can be placed in a closet, or the smallest room in a hospital. Yet it is a disgraceful fact that even modern hospitals have been built in which the rooms for the X-ray laboratory are little more than closets. Not only does the ordinary ventilation become a problem, but the difficulty of providing sufficient protection becomes much increased.

In the days when our examinations were confined chiefly to wrists and ankles, and when our apparatus was small and inefficient, small rooms were also consistently bad. In the present day, however, when our work has become refined, when a great deal of heavy apparatus is used even for the simple examinations, and more so in difficult ones, when no chronic disease of the chest or abdomen is completely investigated without an X-ray examination, small rooms should be as obsolete as are the original small Crook tubes, which are now kept merely for curiosity.

One must be prepared to make chest and abdominal examinations fluoroscopically, radiographically, orthodiographically, and stereoscopically, and in the prone, supine, semierect, and erect positions. These various examinations require special apparatus to obtain the best results, and all means more and more space, so that to-day we need from six to ten times the space that was allotted at the beginning of Roentgen work.

A modern Roentgen laboratory should have a central office, a main Roentgenographic room, a fluoroscopic room, a waiting room, a dark room, and, if possible, a treatment room. To this may well be added a photographic room, a negative exhibit room and a general work shop. There are a few such laboratories in existence. The laboratories of the Rudolph Virchow Hospital in Berlin, the St. Georg Hospital in Hamburg, the Boston City Hospital and the University of Pennsylvania Hospital will serve as examples for future hospitals. At the Rudolph Virchow Krankenhaus an entire building is provided for the Roentgen laboratory, and at the Boston City Hospital 4500 square feet of floor space has been devoted to this work.

No more important department exists in a hospital. This laboratory aids the general surgeon, the general practitioner, and each of the specialists in making diagnoses. In addition to this it renders valuable aid in the treatment of disease. The running of a complete modern laboratory, whether private or in a hospital, involves a great expense and any one who feels differently has simply the confidence of ignorance.

Therefore the public should provide ample space, ample equipment, ample protection, and ample means for running of our hospital laboratories. This is a duty they owe to themselves and to the Roentgenologist. Especially does this apply to the men who have to do with the construction of new hospitals.

Unfortunately the beginning of a new Roentgen laboratory is also often associated with the beginnings of a new Roentgenologist whose consciousness of his ignorance, and the timidity resulting from the narrow margin by which he may have obtained his position, very properly makes him hesitate to make suggestions to a dignified board of trustees. As a result the Roentgen laboratory is an after thought. Therefore it is the duty of every Roentgenologist to constitute himself a committee of one to do personal work in explaining the needs in this specialty.

We should aim to get philanthropists interested in this great opportunity for charity. This charity should even ex-

tend to the provision of a fund for the support of Roentgenologists who have become incapacitated and dependent, or whose families have become dependent, instead of making a wide popular subscription necessary.

Small hospitals, unless heavily endowed, find it difficult to support a modern, fully-equipped laboratory, with the command of a competent Roentgenologist. Therefore they cannot expect the best work.

Likewise, the general practitioner to-day can seldom afford the time, space, equipment nor the necessary knowledge for modern work. Therefore it is his duty to aid in the support of the man who is willing to properly equip himself and a laboratory and devote his life to this work.

So much for the duty of the public and the profession to the Roentgenologist. We, in turn, owe them as much. We owe them competent service, and must therefore each strive to be masters. A Roentgenologist should be a careful, honest, broad-minded man, an intelligent physician and in addition should master the technique of each examination and each form of treatment. He should be familiar with the work that has been done and recorded by other Roentgenologists, and, so far as is possible, with the progress that has been made in the general science of medicine. He should know how to avoid burns either of himself or the patient. He who burns a patient to-day in making an examination is a disgrace to our ranks. He should learn to recognize the truth and not make statements on insufficient evidence. How often we hear absurd opinions expressed by so-called "X-ray experts," whose only excuse for such a title is the possession of an instrument. It is these men who shake the confidence of both the public and the profession in X-ray work. It will take considerable time until the profession even realize that X-ray instruments no more make a Roentgenologist than surgical instruments make a surgeon.

In order to gain the confidence and support of the public and the profession we must show ourselves worthy of it, by being thorough students. We must eliminate guess-work and either state absolute facts or say we do not know. Path-

ological conditions vary to such an extent that we must not be too dogmatic but must be able to see more than one possibility and so far as possible find an explanation for the clinical symptoms. In short, we are in a great scientific field in which only the sod has been turned, and each must help the other to find the hidden truths beneath.

We have a great opportunity at these meetings and I feel that so far as possible, we should make them demonstrative instead of didactic.

Duty of the Roentgenologist to Himself.

Self-protection is the first law of nature, yet it is probably the most difficult of all for the Roentgenologist to observe. It is so difficult because the penalty comes so long after the offence, and each beginner hopes to escape. It is difficult because the enthusiasm engendered by the wonderful new revelations is apt to make him forget all danger.

I should say that he is not safe unless he can carry a photographic plate in his pocket for a week without fogging. This is easily tested by means of a dental film which can be placed in the vest-pocket. He should arrange his apparatus so that he can work from an adjoining room by means of mirrors. He should be separated from the active tube by means of an opaque wall. If he must remain in the room he should confine himself to a leaded cabinet.

Fluoroscopic work is necessary to accomplish the best results in the study of the movable organs. The tube should be separated from the patient by an opaque wall or screen, which only allows a pyramid of ray to pass large enough for the examination. This must be controlled by an adjustable diaphragm. The fluorescent screen should be covered with lead glass, and finally the operator should be behind a lead screen with a lead glass window. He should be able to control all of his apparatus while under protection. This involves many difficulties which each man must master according to his own laboratory. Here again he should attach a dental film to his fore-arm by means of adhesive plaster and control his protection.

We need not develop Roentgenophobia. It is not only possible but practical to have complete protection. Unfortunately many symptoms or diseases have been charged to the effects of the Roentgen Rays that have, I believe, no basis in fact. I will not specify the dangers, the harmful effects, nor the details of protection at this time. All of this has been recorded. I can only say. "Be careful!" You can no more remove the harmful effect than you can turn the wheels of time backward.

Finally, the Roentgenologist owes another duty to himself. This is to make his work valuable, by bringing it as near perfection as possible, and then to value it, and see that he is properly paid for it. No one can afford to do cheap work, for no one can afford to do poor work.

In conclusion, I want to thank the local committee of arrangements for their faithful services in preparation for this meeting; and the officers and members for their earnest efforts to make this meeting a success.

The President resumed the chair.

The Secretary read a communication from the Deutsche Roentgen Gesellschaft, sending greetings, expressing felicitations for a successful meeting, and announcing that the Society was to be represented officially at this meeting by one of its members, Dr. Fedor Haenisch. The chair introduced Dr. Haenisch, who spoke as follows:

Mr. President, Ladies and Gentlemen: I have the honor to represent at this meeting the Deutsche Roentgen Gesellschaft, and I am instructed to bring you hearty greetings and best wishes for a prosperous session. Allow me also to thank you for your kind invitation and for the cordial words of introduction by your President. I also want to express my sincerest gratitude to the men whom I have met in this country, none of whom could have received me more kindly and more heartily. I feel honored at being a corresponding member of this Society and I also anticipate much pleasure and great benefit to come to me from my association with this Society. I also wish to extend to you the kindliest greetings from Professor Albers-Schoenberg, with whom I have been

associated for many years. I also wish to apologize for my inability to enter into a discussion of cinematographic radiography, as I had originally intended to do, because it was impossible to secure the necessary apparatus in time. I have come here to learn, to see your work, and to renew old acquaintances with men whom I have had the pleasure of meeting on the other side of the water.

A communication was also read from Professor Albers-Schoenberg and one from Dr. Charles L. Leonard, the delegate of the Society to the International Congress of Radiology and Electricity in session at Brussels.

The scientific program was then proceeded with, the first paper being read by Dr. Henry Hulst, of Grand Rapids, Michigan, entitled "Tuberculosis of the Lungs as Seen and Heard."

The discussion on this paper was opened by Dr. Kennon Dunham, and was continued by Drs. L. G. Cole and Henry Hulst.

Dr. Alfred L. Gray, Richmond, Va., read a paper on "Primary Lymphangiosarcoma of the Lungs," which was discussed by Drs. Henry K. Pancoast, Kennon Dunham, F. H. Baetjer, Henry Hulst, Fedor Haenisch, L. G. Cole, George C. Johnston, W. F. Manges, George E. Pfahler, and in closing by Dr. Gray.

Mr. H. W. Dachtler, Toledo, Ohio, presented a report on "Studies of Pulmonary Manifestations of Syphilis."

This paper was discussed by Drs. A. W. Crane, Kennon Dunham, Henry Hulst, George C. Johnston, and in closing by Mr. Dachtler.

The Society then adjourned until 2:30 P. M.

FIRST DAY—AFTERNOON SESSION.

The Society reassembled at 2:30, and was called to order by the President.

The Treasurer's report, being called for, was presented by Dr. Charles F. Bowen.

ANNUAL REPORT OF TREASURER.

Report of Treasurer, Chas. F. Bowen, Ph. C., M. D., Columbus, Ohio, from Sept. 24, '09, to Oct. 1, '10.

RECEIVED.

Balance on hand Sept. 24, '09	$ 614.22	
Received from members and manufacturers	2,194.00	
Total		$2,808.22

EXPENDED.

Zapffe, F. C. (Stenographer)	$ 181.25	
Johnston, G. C. (printing)	7.50	
Williams, Browne & Earl (lantern)	16.16	
Haddon Hall (hotel)	55.00	
Nitske Bros. (printing)	3.50	
Richmond & Backus Company (stationery)	3.60	
House, Nelson H. (stenographer)	18.25	
Bornman, John & Son (Quarterly)	302.10	
Usher, Samuel (Transactions N. Y. meeting)	944.08	
National Photo Eng. Co. (half tones)	10.00	
Terry Eng. Co. (half tones)	8.60	
Bornman, John & Son (Quarterly)	277.85	
Nitske Bros. (printing)	12.50	
Bornman, John & Son (Quarterly)	280.75	
Bowen, Chas. F. (expenses of Treasurer)	148.33	
Pfahler, Geo. E. (flowers Dr. Kassabian)	10.50	
		$2,279.97
Balance		$ 528.25

The Treasurer's account for the year of 1909-1910 has been audited this day (Oct. 1, 1910) and found to be correct.

H. K. PANCOAST,
F. H. BAETJER,
Auditing Committee.

Oct. 1, 1910.

On motion, the report was referred to the Auditing Committee, on which the Chair appointed Drs. George H. Stover, Henry K. Pancoast and F. H. Baetjer, with instructions to report on the second day of the meeting.

Dr. Edward H. Skinner, Kansas City, Missouri, then read a paper entitled "Fluoroscopy of the Gastrointestinal Tract."

This paper was discussed by Drs. Henry Hulst, Arthur Holding and George E. Pfahler.

Dr. Howard E. Ashbury, Baltimore, presented a report on "X-ray Findings in Gastric and Duodenal Ulcers," which was discussed by Drs. Fedor Haenisch, George E. Pfahler and George H. Stover. Dr. Ashbury closed the discussion.

Dr. A. W. Crane, Kalamazoo, Michigan, contributed a paper entitled "Skiagraphic Delineation of the Head of the Pancreas."

The paper was discussed by Drs. Henry K. Pancoast, Henry Hulst, Paul C. Perry, Fedor Haenisch, George H. Stover, L. G. Cole, George E. Pfahler and A. W. Crane.

Dr. Fedor Haenisch read a paper entitled "The Value of the Roentgen Rays in the Early Diagnosis of Carcinoma of the Bowel," which was discussed by Drs. George E. Pfahler, George H. Stover, Henry K. Pancoast, E. W. Caldwell, L. G. Cole, Edward H. Skinner, Henry Hulst, and in closing by the essayist.

The next paper was read by Dr. Arthur Holding, Albany, N. Y., entitled "Observation of Cases of Constipation and Obstipation by Means of the Roentgen Rays."

The discussion was opened by Dr. Edward H. Skinner, and continued by Drs. A. W. Crane and Henry Hulst.

Adjourned until 10:00 A. M., Sept. 30th.

In the evening, at 8:30, an informal meeting was held, at which the members exhibited plates and lantern slides of interesting cases.

SECOND DAY—MORNING SESSION.

The Society reconvened at 9:30, and was called to order by the President.

Dr. Pancoast, Chairman of the Executive Committee, reported that the Committee had acted favorably on the applications for membership of the following:

Active Members.

Fred H. Albee, New York; James T. Case, Battle Creek; George C. Chene, Detroit; Walter J. Dodd, Boston; Chas. A. Donaldson, Minneapolis; Otto H. Foerster, Milwaukee; Harrison A. Greaves, Philadelphia; George W. Grier, Pittsburg; H. M. Imboden, Clifton Springs, N. Y.; Carl P. Lathrop, Buffalo; Capt. Leon T. Lewald, New York; A. J. Quimby, New York; W. A. Quimby, Blaine, Ohio; John H. Selby,

Rochester, Minn.; Miles B. Titterington, Jerseyville, Ill.; Raymond L. Wodhams, Wilkes Barre.

Corresponding Members.

Dr. Guido Holznecht, Vienna; Dr. Klynens, Antwerp; Dr. Alban Kohler, Wiesbaden; Dr. Gottwald Schwartz.

On motion, the Secretary was instructed to cast the unanimous ballot of the Society for the election to membership of these applicants, which he did, and they were declared duly elected.

Dr. Edward H. Skinner, Chairman of the Committee on Revision of the Constitution and By-Laws, presented the following report, action on which was deferred until the following day:

CONSTITUTION.

ARTICLE I.

Name: The society shall be known as the American Roentgen Ray Society.

ARTICLE II.

Object: The object of the society shall be the study and practical application of the Roentgen Rays.

ARTICLE III.

Section 1. The members shall be active, corresponding, honorary and associate, and shall be persons interested in the object of the society, recommended by at least two members in writing, and approved by the executive committee, who must have proof of their good ethical standing. They shall be elected by ballot.

Section 2. Active members shall be residents of America, shall sign the constitution, and pay annual dues of $10.00, which shall include subscription to the American Quarterly of Roentgenology.

Section 3. No member who is in arrears for annual dues shall vote, hold office or be entitled to receive the transactions. It shall be the duty of the treasurer to erase from the

roll of membership the name of every member who is in arrears for two years, and report such action at the annual meeting for confirmation.

Section 4. Corresponding members shall be residents of foreign countries.

Section 5. Honorary members shall be persons who have distinguished themselves in Roentgen Ray research or practical work.

Section 6. Associate members shall be persons who are interested in the advancement of the Roentgen Ray, but who are not actively engaged in radiographic or radiotherapeutic work, whose membership is not otherwise provided for. They shall be required to pay annual dues of $10.00, which sum shall include subscription to the American Quarterly of Roentgenology.

Section 7. Corresponding, honorary and associate members shall have all the privileges of active members, except to vote and hold office.

ARTICLE IV.

Officers: The officers shall be a President, five vice presidents, secretary, treasurer, an executive committee of three, and a board of censors, which shall consist of the three last ex-presidents. The officers shall be elected annually by ballot.

ARTICLE V.

DUTIES OF OFFICERS.

Section 1. The president shall perform all the duties pertaining to that office, and shall deliver an address during the annual meeting.

Section 2. In the absence of the president, one of the vice-presidents shall preside.

Section 3. The secretary shall keep, or cause to be kept, a correct record of all transactions of the society in a permanent form. He shall send due notice of all meetings to each member, shall notify all members of committees of their appointment and of the duties assigned to them. He shall conduct the correspondence and perform all duties usually pertaining to his office. The secretary shall have printed an

alphabetically arranged list of the members of the society, with their addresses, for free distribution to members applying for same, which list shall be revised from time to time, and shall specify charter members.

Section 4. The treasurer shall receive and be accountable for all money that shall come into his hands by virtue of his office. He shall give good and sufficient bond to the executive committee for the safe keeping and disposal of his trust, and shall make a full report to the society annually. He shall pay out money only by the written approval of the president and chairman of the executive committee.

Section 5. An executive committee of three members shall be elected as follows: one for three years, one for two years, and one for one year; and thereafter one annually to serve for three years. They shall hold the bond of the treasurer, audit his accounts annually, arrange for annual meetings, and have general supervision of the affairs of the society not otherwise provided for.

Section 6. A board of censors, consisting of the three last ex-presidents, the senior of whom shall be chairman, shall consider all matters pertaining to the conduct of members of the society, and after due consideration and investigation of complaints, if it appears to be misconduct, they shall communicate with the member in question. Upon a continuation of the misconduct they shall refer the matter to the society at the next annual meeting for further action.

ARTICLE VI.

Meetings: The annual meeting shall be held on the Wednesday following the second Tuesday of December of each year unless otherwise arranged by the executive committee.

ARTICLE VII.

Section 1. A committee of publication, consisting of five members, of which the president and secretary shall be members, shall be elected at each annual meeting. They shall be nominated by the nominating committee and elected at the same time as the other officers. The publication committee shall appoint the editor of the American Quarterly of Roent-

genology, and thereafter their power shall cease, except in an advisory capacity.

ARTICLE VIII.

This constitution may be amended by a three-fourths vote of all the members present at an annual meeting, provided the proposed amendment has been read before the society at least one day previously, and the hour for action has been set by the society and announced in open meeting at least one day previously.

BY-LAWS.

1. A nominating committee of three shall be appointed by the president on the first day of meeting. Said committee shall make report on the second day of meeting.

2. The newly elected officers shall take office at the close of the last day of the meeting at which they are elected.

3. All matters of parliamentary usage not already provided for shall be decided according to Roberts' Rules of Order.

4. Papers shall be limited in reading to twenty minutes. Openers of discussion shall be allowed ten minutes and all others five minutes. No person shall speak twice on the same subject except by permission of the meeting.

5. A member found guilty of reprehensible conduct may be expelled from the society on recommendation of the executive committee, and by a two-thirds vote of members present.

6. The order of business shall be:

(1) Call to order.

(2) Reading of minutes.

(3) Unfinished business.

(4) Reports of committees.

(5) Election of members.

(6) New business.

(7) Announcement of nominating committee by the president, or report of same to the society.

(8) Reading of essays.

The Chair at this juncture appointed the following Nominating Committee: Drs. Henry K. Pancoast, Alfred L. Gray and Henry Hulst.

Dr. Alfred L. Gray renewed informally the invitations he presented at the last meeting of the Society from various organizations in Richmond, Virginia, asking the Society to hold its next annual meeting in that city. Dr. Henry Hulst extended a similar invitation on behalf of Grand Rapids, Michigan, and Dr. George H. Stover extended an invitation on behalf of Denver, Colorado.

These invitations were referred to the Executive Committee for action.

Dr. George E. Pfahler, Philadelphia, read a paper on "The Roentgen Rays as an Aid in the Diagnosis of Gall-Stones."

The paper was discussed by Drs. Fedor Haenisch, Henry Hulst, A. M. Cole, F. H. Baetjer, T. E. Potter, Charles F. Bowen, Alfred L. Gray, J. Rudis-Jicinsky, Percy Brown, Edward H. Skinner, L. G. Cole, H. E. Ashbury, and in closing by Dr. Pfahler.

Dr. Sidney Lange, Cincinnati, contributed a paper entitled "Enlargement of the Thymus Gland Treated by the X-ray."

The discussion was opened by Dr. Henry K. Pancoast, and continued by Drs. W. F. Manges, F. H. Baetjer, D. R. Bowen, A. M. Cole, George C. Johnston, and in closing by Dr. Lange.

The paper by Dr. Russell H. Boggs, of Pittsburg, on "The Roentgen Treatment of Carcinoma of the Breast," was read by Dr. Johnston.

Dr. J. Rudis-Jicinsky, Cedar Rapids, Iowa, read a paper on "Roentgen Ray Therapy and its Practical Application in Malignant Lesions."

Dr. George C. Johnston, Pittsburg, read a paper on the "Therapeutic Efficiency of Roentgen Irradiation."

The discussion on these three papers was opened by Dr. Alfred L. Gray, and continued by Drs. W. F. Manges, H. W. Dachtler, H. K. Pancoast, D. R. Bowen, Fedor Haenisch, W. C. Hill, George E. Pfahler and, in closing, by Drs. Johnston and Rudis-Jicinsky.

Dr. Henry K. Pancoast, Philadelphia, read a paper entitled "Leukemia," which was discussed by Mr. H. W. Dachtler

and Drs. Roland Hammond, J. Rudis-Jicinsky, and in closing, by the essayist.

The Society then adjourned, to take an automobile ride around the city, arranged for by the Local Committee.

SECOND DAY—EVENING SESSION.

The Society reassembled at 9 o'clock.

Dr. George H. Stover moved a rising vote of thanks to the Local Committee of Arrangements, and through them to its friends, for the very great pleasure given to the members of the Society by the automobile ride in the afternoon.

Seconded and carried.

Drs. W. F. Manges and Fedor Haenisch showed some lantern slides of interesting conditions.

Mr. H. Clyde Snook, Philadelphia, read a paper on the "Physics and Optics of Stereoscopic Roentgenology."

The discussion was participated in by Drs. George C. Johnston, E. W. Caldwell, Henry Hulst, and Mr. Snook, in closing.

Dr. W. F. Manges, Philadelphia, read a paper entitled "Measurement of the Diameters of the Female Pelvis."

Discussed by Drs. George H. Stover and George C. Johnston.

Dr. Kennon Dunham, Cincinnati, contributed a paper entitled "Stereoscopic Examination of the Chest." This paper was discussed by Drs. P. M. Hickey, George H. Stover, Henry Hulst, and Dr. Dunham, in closing.

Dr. E. G. Beck, Chicago, read a paper on "Stereoscopic Radiography as an Aid to the Surgeon," and Dr. E. W. Caldwell, New York, read a paper on "Stereoskiagraphy of the Urinary Tract."

These papers were discussed by Drs. Sidney Lange, H. W. Dachtler, H. C. Snook, W. F. Manges, George E. Pfahler, and Dr. Caldwell, in closing.

Adjourned.

THIRD DAY—MORNING SESSION.

The Society reassembled and was called to order by the President at ten o'clock.

The report of the Committee on Revision of Constitution and By-Laws was considered and discussed and on motion was adopted.

The Nominating Committee then presented the following report:

President, Percy Brown, Boston, Mass.; Vice-Presidents, W. C. Hill, Cleveland; Edward H. Skinner, Kansas City, Mo.; and W. F. Manges, Philadelphia; Secretary, F. H. Baetjer, Baltimore; Treasurer, Charles F. Bowen, Columbus, Ohio.

Executive Committee, Arthur Holding, Albany, to take the place made vacant by Dr. Osgood.

Publication Committee, P. M. Hickey, Detroit; Sidney Lange, Cincinnati, and D. R. Bowen, Rome, N. Y.

On motion of Dr. E. W. Caldwell, this report was accepted, and the Secretary was instructed to cast the ballot of the Society for the election to office of those whose names had been presented by the Committee, which he did.

The Executive Committee further recommended that the next annual meeting of the Society be held in Richmond, Virginia, at such time as the Committee and the Local Committee of Arrangements may decide.

On motion, the recommendation was concurred in and Richmond was duly selected as the place for holding the next annual meeting.

Dr. F. H. Baetjer, Baltimore, Chairman of the Auditing Committee, reported that the Committee had examined the books of the Treasurer, and found them to be correct. On motion, the report was accepted.

Dr. Percy Brown, Boston, read a paper entitled "The Position of the Roentgenologist in His Own Community." The paper was not discussed.

Dr. Henry S. Upson, Cleveland, contributed a paper entitled "Serious Mental Disturbances Caused by Painless Dental Lesions."

The paper was discussed by Drs. W. C. Hill, H. K. Pancoast, Fedor Haenisch, C. W. Coon, E. W. Caldwell, W. F. Manges, George H. Stover, D. R. Bowen, George C. Johnston, George E. Pfahler, and in closing by Dr. Upson.

Dr. F. H. Baetjer, Baltimore, read a paper on "Bone Cysts," which was discussed by Drs. George C. Johnston, D. R. Bowen, H. W. Dachtler, Fedor Haenisch, C. W. Coon, P. M. Hickey, George E. Pfahler, and Dr. Baetjer, in closing.

Dr. Roland Hammond, Providence, R. I., read a paper on "Chronic Joint Disease from a Roentgenologic Standpoint."

The paper was discussed by Drs. George H. Stover, Percy Brown, C. W. Coon, H. W. Dachtler, and Dr. Hammond, in closing.

Dr. George H. Stover, Denver, Colorado, read a paper entitled "The Radiographer's Property Right in the Radiogram."

Discussed by Dr. Pancoast.

On motion of Dr. Pancoast, the following resolution was adopted:

RESOLVED: That the American Roentgen Ray Society endorses the views presented in Dr. Stover's paper, vesting a property right in the radiogram, with the radiographer, inasmuch as the radiogram is a part of his clinical record of examination.

The Executive Committee through its Chairman, Dr. Pancoast, reported favorably on applications for membership in the Society. (See pages 269 and 270.)

On motion, the Secretary was ordered to cast the unanimous ballot of the Society for the election to membership in the Society of these applicants, which he did.

Dr. Charles F. Bowen, of Columbus, read a paper entitled "The Removal of Foreign Bodies under Fluoroscopic Examination."

The paper was discussed by Drs. W. F. Manges, George C. Johnston, Kennon Dunham, A. L. Gray, George C. Stover, E. W. Caldwell, and Dr. Bowen, in closing.

Dr. Clarence E. Coon, Syracuse, N. Y., described "A Localizer for General Use."

His paper was discussed by Mr. Snook.

Dr. L. G. Cole, New York City, contributed a paper entitled "Cinematographic Roentgenography."

This paper was not discussed.

On motion, the paper by Dr. Sinclair Tousey, New York City, on "The Symptomatic Cure of Prostatic Hypertrophy by X-Rays and High Frequency Currents," and the paper by Dr. Harvey Cushing, Baltimore, on "Tumor of the Hypophysis Cerebri and When to Operate," were read by title and ordered published.

On motion, a vote of thanks was extended to the Local Committee and to the retiring officers for their untiring efforts to make this meeting a success and for their devotion to the best interests of the Society.

At this juncture the President-elect, Dr. Percy Brown, was escorted to the Chair, and addressed the Society briefly, thanking the members for the honor conferred on him.

There being no further business to come before the Society, an adjournment was taken, subject to call, by the Executive Committee.

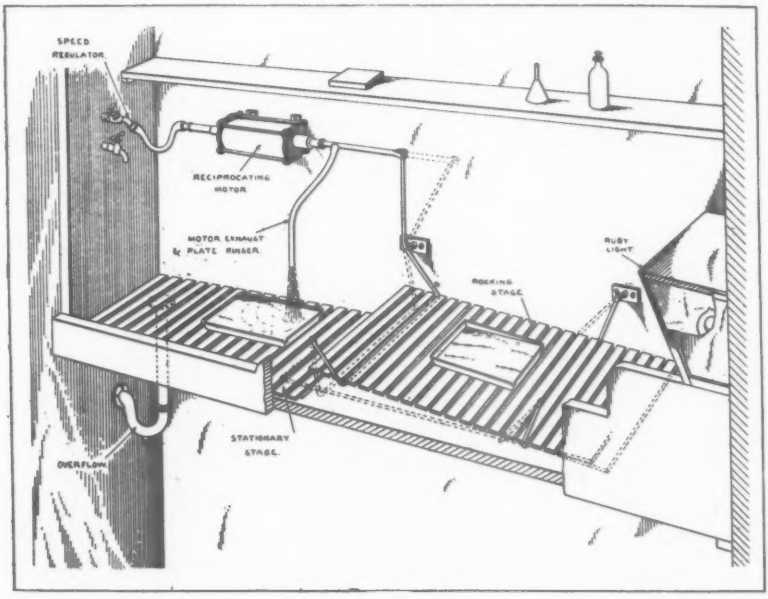
A RADIOGRAPHIC PLATE ROCKER.

BY ROLAND O. MEISENBACH, M. D., BUFFALO, N. Y.

After having employed various appliance for developing Radiographic plates, the rocking motion was found to be the most efficient and more closely resembling that which is used by photographers for developing photographic plates, the exposures of which are of different lengths. The excellency of the negative frequently depends upon the manipulation of the plate while in the developer, different results may be had by variation of this manipulation. Aside from the exposure and the chemistry of photography, other things being equal, an under-exposed plate may be fogged if the developer moves too rapidly, as may also be an over-exposed plate if the developer moves too slowly. Experience has shown that a titubaling motion of the developing tray may concentrate

the precipitate of the developer so that it has an unequal effect upon the plate.

An under-exposed radiographic plate can often be forced by the speed with which the solution passes over the film. By having the speed of the plate rocker under easy control, the desired effect in developing may be secured. For this purpose a simple and effective plate rocker has been devised by the author after having discarded titubalators and the like. The frequency with which requests for sketches and detailed construction from visiting surgeons who have seen it in operation have come to me, has prompted me to give this description which may be of interest.



The Plate Rocker (Fig. 1) has been used almost daily for over two years and has therefore been thoroughly tried out. It has required no attention during that time. The apparatus can easily be installed by any carpenter. It consists essentially of two parts, a reciprocating water motor and the Rocker. The water motor can be procured from any hardware dealer and is ordinarily used for washing machines. It should

be firmly fastened to the wall of the dark room and connected to the water supply; the piston rod is attached to the upright of the Rocker and the speed of the motor controlled by means of the faucet to which it is connected. The exhaust moves to and fro with the piston rod; the water flowing from it is conveniently used to rinse the plates after they have been taken from the developer. The Rocker proper is suspended on the inner sides of the wooden concrete drain box and may be built as large as desired; any number of trays can be placed upon the platform rack.

The advantages of this simple Plate Rocker are that its construction is simple, its speed can be regulated in an instant, its motion is almost noiseless and pitches the developer properly, and further, that it does not heat but tends to cool the dark room and developing solutions in warm weather.

140 Allen St.

TRIBUTE TO DR. KASSABIAN.

To Dr. Mihran Krikor Kassabian, friend, colleague, author and gentleman, we would pay great tribute.

We respected and honored him in life; we lament and mourn his demise. The memory of him will always remain sacred to us. The history of his life affords much that is interesting and commendable.

He was born on August 25th, 1870, at Cessaria, Cappadocia, Asia Minor (Armenia). He died July 14th, 1910, in Philadelphia, Pa.

Almost from his birth to his death he was surrounded by danger. In his home country he was exposed to epidemics of cholera, experienced the terror of earthquake, and was surrounded by the horror of massacre. In his adopted country he was one of the first to take up the study and use of the Roentgen Ray, was in the Spanish American War, and enlisted in the regular army (Hospital Corps).

Dr. Kassabian's early education was received in an American Missionary Institute, where he afterward became a teacher. Early in life he became interested in photography and attained great skill. In 1893 he went to London, where he

DR. MIHRAN KRIKOR KASSABIAN

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studied theology; from there he came to America (1894) and again took up work in photography, until the fall of 1895, when he matriculated at the Medico-Chirurgical College of Philadelphia, and graduated in the spring of 1898!

During his college life he spent all his spare time and vacations earning money to obtain his medical education, and he was never idle.

Soon after graduating he was appointed skiagrapher and instructor in Electrotherapeutics in the Medico-Chirurgical Hospital and College of Philadelphia, in which capacity he served until 1902. In 1903 he was appointed director of the Roentgen Ray Laboratory of the Philadelphia Hospital, which position he held until his death.

The most striking features of Dr. Kassabian's life were that he was a constant student, a hard worker and a thorough investigator. With limited means and education he completed his medical course in a praiseworthy manner.

Roentgen had just recently described his discovery and told the world of its wonderful properties and its possible value as a diagnostic agent. This interested Dr. Kassabian immediately, and before he took up the work he had investigated the then known properties of the X-Ray. With his usual enthusiasm he took up the practical application of the rays and started in to help along the most remarkable development of this wonderful agent. Ignorant of the dangers and cognizant only of his duty and the possibility of new discovery he was exposed constantly to the action of the rays. Precaution of any sort was unheard of. The comparative value of fluoroscopic work then, was greater than now because of the fact that skiagraphs were difficult to make. The demand of the surgeon was for a fluoroscopic examination. It was the ambition of the operator to demonstrate by means of a skiagraph, and in this Kassabian did some of his most valuable work, because of his skill in photography and a good working knowledge of electricity.

It was during his first few years of work that he received the injuries which afterward brought him to an untimely end. Strange it may seem, but he was among the first to realize

the harmful effects of the rays. He realized his danger but could not possibly be aware of the incurable nature of the damage he was receiving. He has often said among his friends, "I would have stopped the fluoroscope then but they would not let me."

In those days there was a tendency for the charlatan to make use of electricity in all its possible phases, and it was largely the efforts of Dr. Kassabian and his colleagues that kept the Roentgen Rays from becoming a headline of the advertisement of the "quack."

Dr. Kassabian was a charter member of the American Roentgen Ray Society, was a potent factor in its early development, and remained an active and enthusiastic worker to his last days.

The use of X-rays in forensic medicine interested him greatly. His thoroughness, fairness and skill have done much toward establishing the value of this agent before the courts. He was a most excellent expert witness.

The results of his labors remain as a monument to his memory in the two editions of his "Electrotherapeutics and Roentgen Rays." Encouraged and advised by the leading scientists and physicians of Philadelphia and elsewhere, Dr. Kassabian started this work in 1903. In 1907 the first edition was published, and the second edition was taken from the press just about the time of his death.

One need but examine these books to realize the thorough and painstaking manner in which he worked. Only a few of us know how he suffered during the last two years of his life, and we all had the most wonderful admiration for him because of his patience, his constant continuation of his labors. and his heroic acceptance of the radical measures adopted in the effort to save his life.

During his professional career he was honored by the Government of Pennsylvania with the appointment of X-ray expert to the tuberculosis congress, and by The American Medical Association as its representative to international meetings in foreign countries.

He had a professional dignity and reserve, skill and knowledge that won for him the confidence and appreciation of both patient and physician.

After having become a naturalized citizen of the United States he went back to his former country and married a charming and intelligent lady of his own nationality.

To this lady, his bereaved widow, we would extend a most profound sympathy. She is to be more than admired for the loving, tender, and womanly manner in which she cared for her husband through his protracted and terrible suffering.

W. F. M.

ABSTRACTS FROM CURRENT LITERATURE

Orthodiagraphy in Pathological Conditions of the Heart and Aorta. Claytor (Thos. A.) and Merrill (Walter H.) in Am. Jour. of the Med. Sciences, Oct., 1910, p. 506, continue their studies published in the same journal Oct., 1909, p. 549, in which their technic was given.

By implication, at least, much importance is laid upon trained observation and the statement is made that "after some experience in making diagrams of the heart it is seldom necessary to resort to the actual measurement of the resulting figure, as one may see at a glance whether or not there is any material distortion of the outline."

Due notice is taken of the normal variation in the size of the heart, and other difficulties and sources of error are considered.

Twenty-one diagrams of normal and pathological conditions are given.

This article is another index of the growing interest in the art of fluoroscopy.

Bone Cysts, Ostitis Fibrosa, Giant Celled Sarcoma and Bone Aneurism of the Long Pipe Bones. Jos. C. Bloodgood, M. D., Baltimore. Annals of Surgery, Aug., 1910, p. 145.

Two classifications of bone cysts are given comprising 89 cases.

Group (A) (69 cases)—The true bone cysts, which have a definite relation to ostitis fibrosa.

1. Medullary cysts (16 cases), in which the bony shell has no definite connective tissue lining.

2. Cyst with definite connective tissue lining (22 cases).

3. Small cyst or cysts in a solid mass of ostitis fibrosa (6 cases).

4. No cysts but the bone shell is filled with solid mass of (7 cases).

5. Multilocular cysts (6 cases).

6. Miscellaneous: (a) infected, 1 case; (b) X-ray studies only 5 cases; (c) autopsy specimens, 3 cases; (d) healed bone cysts, 2 cases; (e) cysts in infantile scurvy, 1 case.

Group (B) (20 cases)—Cysts in the medullary cavity due to other conditions.

7. Cysts in cartilage tumors or enchondromas (4 cases).

8. Pure myxomas with or without cysts (5 cases).

9. Cysts in giant cell sarcoma (4 cases).

10. Cysts in arthritis deformans or ostitis deformans (4 cases).

11. Cysts due to a subperiosteal hematoma with a bony wall due to ossifying periostitis (2 cases).

12. Callus cysts (1 case).

Writing of giant cell sarcoma, Bloodgood says: "The X-ray shadow does not differ at all from that of a bone cyst. * * * In my experience, in the fully developed bone cyst or giant cell sarcoma, one would be able to exclude with considerable certainty any other medullary lesion, except the myeloma when occurring as a single lesion, but I can imagine that in the very early stage of the more malignant medullary sarcoma the shadow could not be differentiated from that of cyst or giant cell sarcoma. For this reason the ultimate diagnosis must rest until the exploratory incision is made."

Some excellent reproductions are shown while one or two are of the sort that aid the expert little and lead the general practitioner into doubt. A long bibliography is given.

The Radiographic Diagnosis and Classification of Early Pulmonary Tuberculosis. Lewis Gregory Cole, M. D., New York. Am. Jour. of the Med. Sciences, Philadelphia, Oct., 1910, p. 29.

In this paper appears in detail the most complete record to date of the writer's well-known work. Of especial interest is the statement: "I have been criticised for stating that certain plates showed miliary tubercles. * * * In speaking of miliary tubercles, I refer to those of moderate size, which on cross section of the lungs appear as grayish-white nodules about the size of a pin head. Pathologically these are composed of exudate or productive tissue in a number of adjoining air cells. In studying them radiographically they are compared in density with the air that should normally fill those cells, instead of tissue of similar density as is the case in tuberculous infection in any other part of the body. * * * It is the intermediate tubercles, the smallest ones that are clearly discernible to the naked eye on the cross section, those that give the 'shotty' feeling to the cut surface of the lung, that show clearly in a radiogram having sufficient detail. It is on these tubercles that the positive diagnosis of incipient pulmonary tuberculosis by the X-ray depends." Much of the paper has appeared before, but the classification is new and the whole merits careful study.

The 21 reproductions are a credit to the publishers and the accompanying legends add much to the clearness of the text.

A Universal X-Ray Frame. Anedee Granger, M. D., New Orleans. N. Y. Med. Jour., Sept. 10, 1910, p. 504.

This apparatus has since been patented.

The writer describes apparatus somewhat of the Beclere type, its essential differences being the use of bevel gears to replace the balancing weights and the use of floor and ceiling

tracks upon which the uprights are movable in one direction. This frame is claimed to be applicable for all positions of radiography and fluoroscopy.

Fully lettered illustrations make the text clear for one who wishes to construct similar apparatus.

The Diagnosis of Stone in the Pelvic Ureter. A Preliminary Report of Certain Limitations of Radiographic Diagnosis and a Suggested Remedy. Hugh Cabot, M. D., and W. J. Dodd, M. D., Boston. Boston Med. and Surg. Jour., July 21, 1910, p. 85.

After quoting, from Jeanbrau, the three causes of non-visibility of calculus by the X-ray:

(1) Faulty technique (absence of compression, tube of too high penetration, etc.).

(2) Chemical composition of the stone.

(3) Its small size; the writers add **(4) The position of the stone.** Two cases are related. (I) In which, after negative radiographs by an expert, a "fair sized" oxalate stone was taken by operation from the ureter at the point where it crosses the iliac vessels.

Profiting by this experience case II was radiographed with the patient lying on the back with an Edebohls bag under the lumbar vertebrae, tube 30 in. from the plate, over the umbilicus and directed obliquely downward into the pelvis. A larger oxalate stone was shown which had been invisible by ordinary technic.

From these cases they conclude that (1) even with good technic, stones of moderate size and high density may fail to show when they lie in the portion of the ureter lying in front of the sacro-iliac joint, if the tube be placed in the ordinary position. (2) Some, at least, of the calculi lodged in this position can be detected by X-ray if the tube be placed in the position described.

After detailing some experiments upon the skeleton, the writers state, "The application of these observations to actual

conditions depends chiefly upon the thickness of the iliopsoas muscle. A large muscle will make detection of calculi by this method relatively easy, while a thin muscle will make it difficult."

DAVID R. BOWEN, M. D.

FORTSCHRITTE AUF DEM GEBIETE DER ROENTGENSTRAHLEN.

BAND XV, HEFT 4, 5, 6.

Roentgenologic Diagnosis of Fractures of the Base of the Skull, by Dr. Alexander Markovic.

The Roentgen method is a very valuable aid in the diagnosis of fractures of the base of the skull.

Four typical positions are described:

1. The ordinary lateral view: (a) sinistro-dextral and (b) dextro-sinistral.
2. The usual postero-anterior view as for examining the frontal sinus.
3. The antero-posterior view: (a) fronto-occipital and (b) through the open mouth.
4. The oblique lateral view: (a) axis of ray from exit angular process of one side to malar prominence of other and (b) vice versa.

The pathologic changes which may be recognized are:

1. Actual loss of continuity of the cranial bones. Fissures must be carefully differentiated from sutures and grooves for arteries.
2. Hemorrhage into the pneumatic spaces.
3. Secondary changes, such as empyema of one or more of accessory sinuses, exostoses of cranial bones, calcification areas in brain, and exceptionally an intercranial tumor.

Five cases of fractures of base of brain recognized by X-ray examination are briefly described. In all of the cases the X-ray findings were fissured fractures in the occipital region. According to Markovic but three other cases of fractures of base of skull recognized by X-ray examination are on record.

Periarthritis Humero-scapularis with Calcification, by Dr. G. Fedor Haenisch.

This term is applied to the conditions in which upon the radiogram peculiar shadows are found in the area between acromion and greater tuberosity of humerus. Bursitis subdeltoideus and sub-acromialis, or Duplay's disease are synonyms for this condition. The report is based on the examination of 12 cases. Six cases are described in detail. The onset of symptoms is usually gradual, with a feeling of loss of power in arm, pain and tenderness over greater tuberosity or below acromion and limitation movement, especially of abduction. Four of the cases were directly traceable to a previous trauma.

The X-ray finding consists in irregular, structureless masses of varying size and thickness just above greater tuberosity. In the traumatic cases the shadow cannot always be differentiated from an injury to the greater tuberosity.

The cause of the shadow in most cases has been found to be lime deposits in the sub-acromial bursa, occasionally the sub-deltoid bursa is involved.

The relation of the pain and acute symptoms to the calcification is not constant. Marked symptoms occur in cases in which the X-ray shows no shadows and vice versa. After the process is an old one lighted up by a trauma.

The course of the disease is variable. In two cases the shadows disappeared under conservative treatment. As a last resort, excision of the bursa is recommended.

Concerning Lung Induration, by Dr. von Dehn.

A 17-year-old boy who three years previously had made a poor recovery from variola, complained of pulmonary symptoms since that time. He was dyspnoeic, coughed and expectorated foul-smelling material in which no tubercle bacilli could be found. There was absolute dullness and bronchial breathing over the entire left chest.

X-ray examination revealed an almost complete clouding of left side, only a small amount of X-light penetrating the left apex.

A diagnosis of lung induration with (because of the profuse foul expectoration) bronchiectasis was made. This in all probability was secondary to a bronchial involvement accompanying the variola three years previous. The author calls attention to the tendency of the pulmonary tissue to react to irritants by the formation of fibrous tissue. This condition may follow lobar pneumonia or follow the bronchitis of influenza, typhoid, measles, pertussis, etc. Pleural adhesions, which interfere with expectoration, and bronchial gland enlargement (which Köhler found to be a common sequel to influenza, etc.) may lead to induration. The condition must be differentiated from fibroid phthisis.

The Roentgen Diagnosis of Pathologic Fixation and Displacement of Abdominal Organs, by Dr. C. B. Schürmayer.

The author calls attention to the frequency of adhesions of stomach (especially pylorus) and duodenum to liver and gall-bladder. Such a condition may follow either gastric ulcer or cholecystitis and clinically may simulate either.

Roentgenographically this condition may be recognized in several ways. When adherent to the liver the stomach is pulled over to the right and pylorus elevated during the retraction of liver (expiration). By "Roentgen palpation" before the fluoroscope, hooking the ulnar margin of hand over the pylorus, the traction on the pylorus by the adhesion may be seen. Deep respiration is painful at site of adhesion.

Adhesions of the colon may be likewise recognized by disturbed motility of same, and by a small elevation of wall of colon at site of adhesion. By Roentgen palpation a decrease in the respiratory displacement of colon may be noted.

The author comments upon the ease with which enteroptosis can be recognized by the low diaphragm and liver, by the low stomach and the increased lumbo-costal angle.

Nephroptosis which so frequently accompanies enteroptosis may be recognized fluoroscopically by a kink in diaphragm which the low kidney makes at the junction of its middle and outer thirds. Radiographically the low kidney may be recognized by its relation to psoas margin, to twelfth rib and to pelvic brim. Normally the lower pole of kidney does not go below the junction of second and third lumbar vertebrae and lies slightly external to psoas margin.

The importance is emphasized of the X-ray examination in gastroptosis in controlling therapeutic measures and in the choice of operative means for relief of same. The skiagram is often necessary to differentiate gastroptosis cachexia from that of carcinoma ventriculi.

Coloptosis often produces symptoms resembling appendicitis or typhlitis. Atony of caecum and appendiceal symptoms can be relieved by treating the mechanical causes of the constipation. Schürmayer does not subscribe to Holzknecht's theory of colon peristalsis. He claims to have a series of plates showing that the progress of the contents of the colon is slow and uniform. The great value of the X-ray in the above conditions is to indicate and control therapy and to make "exploratory laparotomies" less justifiable.

Isolated Fracture of the Capitellum of the Humerus, by Dr. G. Fedor Haenisch.

Dr. Haenisch reports the first case of isolated fracture of the capitellum (external condyle of the humerus). The injury was produced by a fall backward, the flexed elbow being placed against the back to break the fall. The external condyle thus received the direct force of the fall. The capitellum was fractured longitudinally and displaced slightly toward the volar aspect of arm. Both antero-posterior and oblique lateral skiagrams revealed the injury. Treatment consisted in operative removal of fragment.

Roentgenography and Roentgentherapy—Two Complementary Problems, by Dr. Th. Christen.

By a mathematical process Christen formulated equations to determine the character and intensity of X-rays best suited to Roentgenography and to Roentgentherapy. It is the non-absorbed rays that affect the photographic plate, whereas, the physiological effects upon the tissues depend upon the absorbed rays. Instead of absorption co-efficient, he adopts the term "Halbwertschicht," meaning the thickness of the layer of any material required to absorb just one-half of the rays of a given skiagraph. His conclusions are as follows:

1. For the best photographic representation of an enclosed material (e. g., bone) the quality of the rays must be so chosen that the "Halbwertschicht" of the surrounding material (e. g., muscles, etc.), fulfills equation No. 26 (see original article).

2. Finest shadow differences are shown best by using rays of such quality that 5/8 are absorbed and 3/8 passed through.

3. The effectual dose is not only proportional to the intensity and the time of exposure, but also to co-efficient of susceptibility and absorption or instead of latter inversely proportional to the "Halbwertschicht."

4. The principle of homogenous exposure is incorrect from the physical standpoint because in a homogenous field the absorption and therewith the effectual dose are both zero.

5. A deep lying tissue will receive the maximum dose when the penetration of the rays is such that the "Halbwertschicht" in the overlying tissues is 7/10 the thickness of these tissues or when the overlying tissues absorb 5/8 and allow 3/8 to pass through.

6. It is true that the relation between superficial and deep dosage is most advantageous the harder the rays and the greater the focal distance. Nevertheless, it is hardly advisable to use the rays harder than 7 or to increase the focal distance to more than five times the thickness of the overlying tissue as the advantage gained would be too slight to justify the great waste of Roentgen energy.

7. The relation between superficial and deep dosage can be more easily improved by artificially changing the co-efficient of susceptibility, especially by the method of Schmidt (pressure anaemia).

Critical Observations upon the Use of Contrast Producing Materials in Roentgenology, by Dr. C. Kaestle.

Kaestle emphasizes the great advantage of the use of Zirkon-oxid in X-ray work over the various bismuth preparations. Zirkon-oxid is absolutely non-poisonous in all quantities at all times. It is insoluble in concentrated hydrochloric acid. It requires one and one-half times the quantity to produce the same shadow as bismuth subcarbonate, but the Zirkon-oxid may be used in any quantity. It is much cheaper than any bismuth preparation.

Bone Carcinoma in the Radiograph, by Dr. George Becker.

Bone metastases in carcinoma are not such uncommon complications as the few recorded cases in the literature would lead one to believe. In the majority of cases, the condition has been discovered only at autopsy. In only a few cases either in the presence of palpable bone enlargement, spontaneous fractures or nervous symptoms from involvement of spine or skull has the diagnosis been made intra vitam. Even at autopsy the condition may be overlooked, for the bone destruction may, according to Recklinghausen, be accompanied by new bone formation, and thus be overlooked.

The skiagram showing such bone metastases may thus discover the presence of otherwise unrecognized primary tumors. The demonstration of these bone lesions is especially important in contraindicating operative measures in these cases. "Rheumatic" pains, general bone pains or nervous symptoms may call attention to the condition.

Bone metastases most frequently follow breast and prostate carcinoma, less commonly thyroid and stomach cancers, and rarely uterine or gall-bladder growths.

Two cases of widespread skeletal carcinomatosis are described both following mammary carcinoma. The metastases were found in ribs, spine, pelvis, skull, shoulder and hip.

A Typical Post-Traumatic Ostitis of the Carpal Scaphoid Often Leading to Spontaneous Fracture, by Dr. George Preiser.

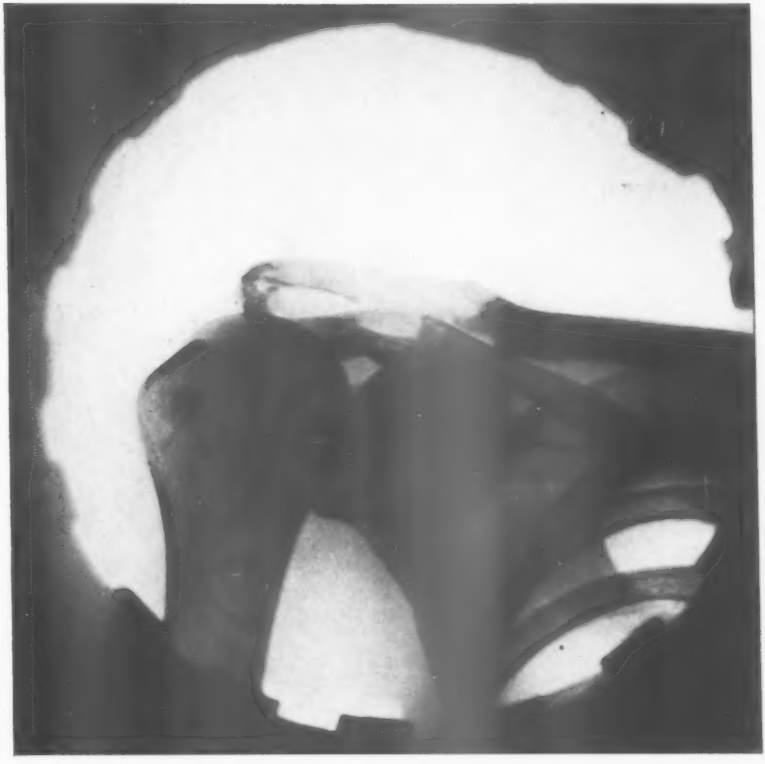
Five cases of injured scaphoid in which a definite structural change in this bone followed the injury form the basis of this report. This change consisted in an area of rarefraction in the middle of the scaphoid and followed slight traumas to the wrist From a study of the blood supply of the bone, Preiser advances the theory that the rarefraction is consequent to a primary tearing loose of an important nutrient ligament from the middle of the bone. This rarefraction may render the walls so weak that, upon the X-ray plate it may simulate a fracture or because of this weakness a fracture may follow.

EDITORIAL.

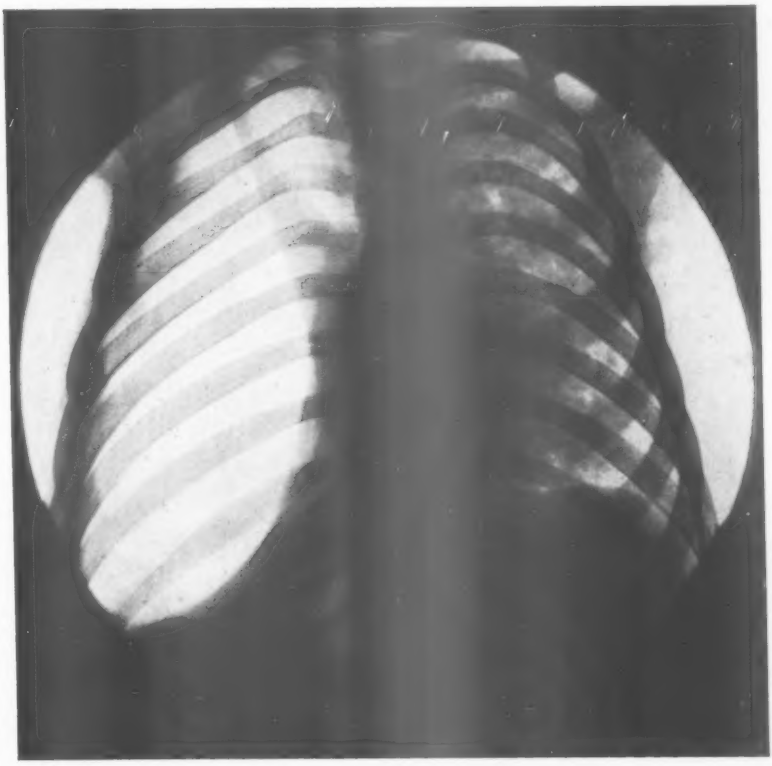
QUALIFICATIONS OF THE ROENTGENOLOGIST OF THE PRESENT DAY.

As the outcome of the extraordinary development of X-ray work during the past few years, Roentgenology has now come to be recognized as one of the most important of the special branches of medicine, and for this reason, if for no others, the Roentgenologist should be fittingly qualified to assume the many responsibilities attending his work; and he should be able to command the respect and confidence of his profession through his personality as a medical man and his qualifications as a Roentgen expert. The general recognition of the importance of X-ray diagnosis during the first year or two following the announcement of Roentgen's discovery, called for the services of a large number of individuals, but because of the simplicity of the work and the comparative ease with which the crude apparatus could be manipulated at this undeveloped stage, the services of an expert or a specialist were hardly considered necessary, as is the case to-day. Not having the time to devote to it himself, the physician or the surgeon who realized the need of whatever X-ray work could then be accomplished, naturally placed it in the hands of someone under him. As a result, a large part of the early X-ray work, at least in this country, was, on the one hand, turned over to under assistants or even individuals with no medical training, such as hospital pharmacists or nurses; or on the other hand, patients were sent to expert electricians or physicists who were working with X-ray apparatus from a purely scientific standpoint, or even to dealers in X-ray equipment.

The subsequent rapid development of X-ray work along all lines soon called for the skill and experience of an expert, who not only understood the manipulation of the more complicated apparatus, the nature of the X-ray output, and the



CARCINOMA OF CLAVICLE AND ACROMION.
(Metastasis from Stomach.)
W. C. HILL, M. D.

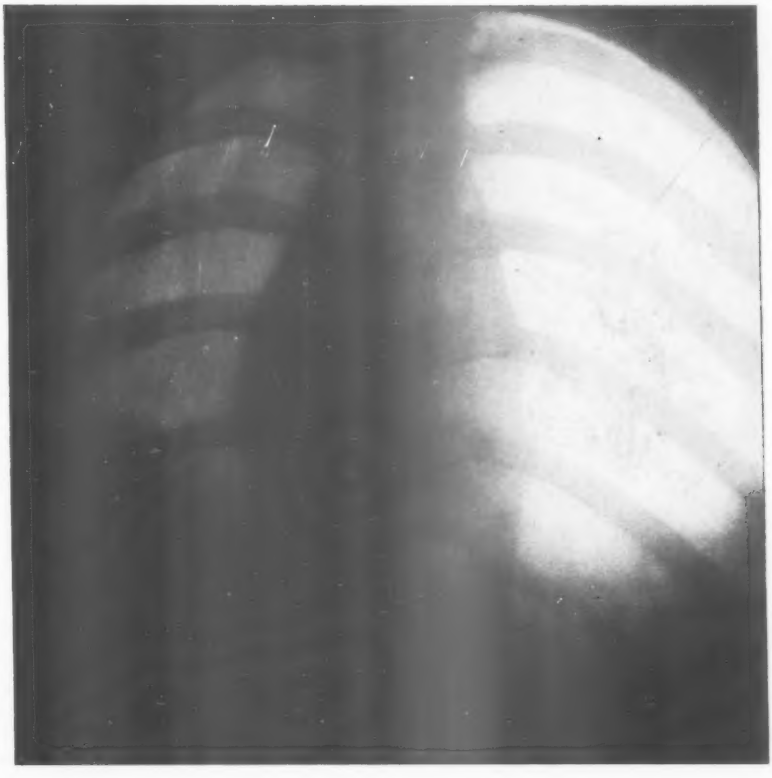


PNEUMOTHORAX SHOWING PARADOXICAL DIAPHRAGM.

Sidney Lange.

This plate is of especial interest because it shows a pure pneumothorax without any fluid or pus in the pleural cavity. The upper contour of the diaphragm is thus revealed. A comparison of the diaphragm contour of the two sides shows clearly the condition known as "paradoxical diaphragm" upon the affected side. It is low, has a concave instead of convex upper contour and executes paradoxical excursions, i. e., rises in inspiration and descends in expiration.

The collapsed lung is held by an adhesion at the apex. The opposite lung is infiltrated with tubercles.



SPINAL ABSCESS IN THE LOWER DORSAL REGION.

Sidney Lange, Cincinnati.

The patient, a girl aged 21, sought medical attention because of a fluctuating swelling in the right inguinal region. X-ray examination was requested to discover possible cause of this psoas abscess. There was some indefinite pain and stiffness in spine, but patient was able to move about, and bend the spine, etc., without much discomfort. Some muscular rigidity and a slight prominence of the spinous process of the 10th dorsal vertebra attracted attention to this part of the spine.

A close examination of the original plate revealed a fusion of the bodies of the 10th and 11th vertebra. The surrounding abscess could be distinctly traced, on the negative, through the diaphragm and into the psoas sheath.

means of measuring and controlling it in order to use it to best advantage and with the minimum of risk to the patient and himself; but whose medical training and Roentgenologic experience, on the other hand, qualified him to treat such conditions as were amenable to radiation and rendered him efficient as a Roentgen diagnostician.

While we are now inclined to excuse a large part of the evil that resulted at the hands of the early X-ray workers, on the grounds of ignorance of the dangerous effects of prolonged exposure and the lack of any means of estimating or of controlling the quality and volume of the X-ray output, and especially as a score or more of the pioneer workers have paid the penalty of their ignorance by death, and many more by the loss of fingers, hands, or arms, or by untold suffering, such is not our attitude at the present day, and the infliction of an X-ray ulcer upon a patient is rarely excusable and the chronic dermatitis is altogether avoidable on the part of those who have entered the field in comparatively recent years. Unfortunately these formerly excusable evils continue, and at a time when, for the most part, they cannot be regarded otherwise than as the results of inexcusable ignorance or of gross carelessness, and the altogether too frequent occurrence of the acute X-ray ulcer at the present time tends to reflect more or less discredit upon Roentgenology. We are fortunate in being able to trace the large majority of such accidents to the continuance of X-ray work in the hands of inexperienced medical graduates or individuals with not even a medical training. This much being definitely known, it is time that some steps were taken toward the correction of such an evil.

While this is undoubtedly both a difficult and a delicate proposition with which to deal, it is a subject which must be given serious attention in the near future. Perhaps the most rational method of dealing with it would be based upon some such principle as the recognition by Roentgenologists both here and abroad of certain definite qualifications as standard requirements in the case of anyone who attempts to practice Roentgenology. A further step would be an at-

tempt to make the medical profession realize the urgent necessity of such a move, and to seek their co-operation in putting it to practical test. The solution of the problem would be very simple if the profession as a body demanded that certain qualifications be fulfilled by Roentgenologists before referring their cases to the latter. Such an attitude should not be construed as being in any way an attempt to discourage new men from taking up X-ray work, for Roentgenologists are fully aware of the fact that the demand for efficient X-ray workers is to-day far greater than the supply, and that this will continue to be the case for some years to come. But the new man must be competent at the start, and unless some such stand is taken, not only will recent graduates in medicine take up the practice of X-ray work without adequate theoretical training and a safe amount of practical experience to properly fit them to assume the responsibilities such work entails, but also, individuals without even medical training. Strange as it may seem to many, it is a fact that there are to-day a large number of such individuals actively engaged in X-ray work who do not know the difference between a hard and a soft tube, or the indications for the use of one or the other; or who will attempt to employ one tube for all varieties of X-ray work; or who do not realize the absolute necessity of determining tube resistance or of using a milliammeter.

Most of the larger medical colleges include a course in Roentgenology in their curriculum, but in only a very few instances is such a course sufficiently comprehensive in itself to properly fit a man to take up X-ray work. Such courses may impart an adequate theoretical knowledge, but what is equally as important, but is rarely if ever provided for, is some actual practical experience, under the personal instruction of a competent Roentgenologist, in the manipulation of different forms of apparatus, the estimation and means of controlling X-ray output, the proper quality and volume of radiation required for different purposes, and the appropriate technic to be employed in each of the different applications of the X-ray. Moreover, one should be thoroughly familiar

with the sources of danger to both the patient and himself, and of the means of avoiding them. The responsibility of such teaching rests largely on the shoulders of the Roentgenologist, and if circumstances do not permit him to give the proper amount of training, he should make it a point to see that his pupils fully understand that his teaching alone does not fit them to assume the responsibilities of practicing Roentgenology.

In conclusion, the following suggestions are offered as possible means of lessening the dangers attending X-ray work and of furthering the progress and best interests of Roentgenology.

1. Anyone who attempts to practice Roentgenology for any purpose should be a medical graduate, with such preliminary training and practical experience as have just been advocated.

2. The X-ray laboratories of institutions should be placed in the charge of **competent** Roentgenologists, who should be recognized as the heads of such departments, and not dominated by members of either the staffs or the managements. A Roentgenologist who possesses the qualifications in respect to training and experience that are essential for his recognition as an expert certainly is deserving of the courtesy of an appointment on the staff of a hospital which he serves.

3. The manipulation of X-ray apparatus should not be intrusted to nurses or other unqualified assistants except under the direct supervision of the Roentgenologist.

4. The practice of Roentgenology by dealers in X-ray apparatus should be discouraged, because, in the first place, such individuals do not possess the requisite qualifications, and secondly, for the same reasons that the practice of any other branch of medicine by similar individuals is discountenanced.

5. The qualifications that should be recognized as essential to fit one to practice Roentgenology are, first, an adequate **theoretic** knowledge embracing electricity, electrical conductivity especially, all forms of X-ray apparatus and their man-

ipulation, and the various methods of determining and of controlling the quality and volume of the X-ray output; secondly, a suitable **practical** experience, gained through a course of several months' training as an assistant to an experienced Roentgenologist; and thirdly, a **medical degree,** because of the essential medical training which this implies.

6. Every possible precaution should be taken to protect patients from unnecessary evil effects of X-ray exposure. Likewise, the Roentgenologist should observe the proper precautions for his own protection, not only for his own welfare, but also because one who disregards the safety of his own person is likely to be regarded as careless in respect to that of his patients.

—H. K. P.

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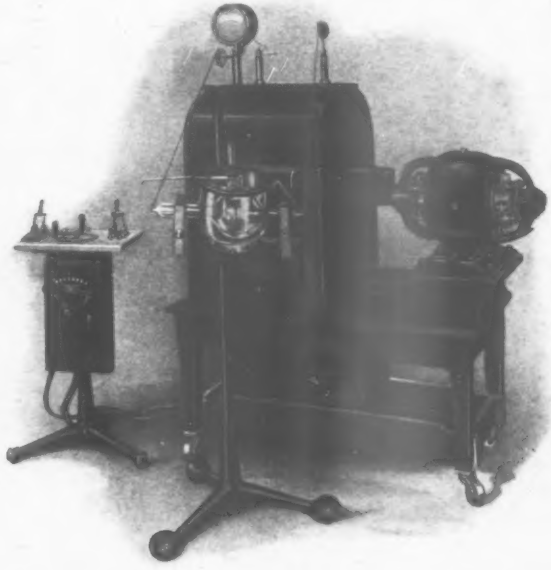

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